AN EVALUATION OF SAFE FOOD HANDLING KNOWLEDGE, PRACTICES AND PERCEPTIONS OF MICHIGAN CHILD CARE PROVIDERS

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ABSTRACT

AN EVALUATION OF SAFE FOOD HANDLING KNOWLEDGE, PRACTICES AND PERCEPTIONS OF MICHIGAN CHILD CARE PROVIDERS

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By 1999, 80% of children will receive child care outside of their homes. Safe food handling knowledge, practices and perceptions of child care providers can influence children's risk for foodborne illness. Child care provider's safe food handling knowledge, practices and perceptions need to be identified so efforts can be made to reduce children's risk for foodborne illness.

The study objectives were to determine: (1) the effect of the educational booklet, **What You Can't See Can Hurt Your Kids and You!**, on perceived suceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control; (2) the relationship between safe food handling knowledge, practices and perceptions; and (3) the acceptability of the booklet by child care providers.

Self-administered, mailed pretests and posttests were sent to two randomly selected samples of 1000 day care home providers and 1000 child care centers. Subjects within the samples were randomly assigned to one of four groups defined by the Solomon Four-Group Design. The total number of respondents was 293 home providers and 367 center teachers.

Center teachers were knowledgeable about aspects of safe food handling assessed. Home providers need information about handling leftovers safely, indicators of unsafe food and reserving food. Home providers need to improve the following practices: checking food temperatures, cooling leftovers in shallow pans and not tasting food to determine if it is safe. Center teachers only need to not taste food to determine if it is safe to eat.

Perceived susceptibility to foodborne illness significantly changed after both home providers ($t=3.72$; $p=.0001$) and center teachers ($t=6.02$; $p=.0001$) read the booklet. Perceived seriousness of foodborne illness and health locus of control did not. Two-way analysis of variance showed change in perceived susceptibility was due to reading the booklet and not pretesting.

The booklet was acceptable to providers as determined by ease of reading, format and content. The topics they indicated they learned the most about were foodborne illness, sanitizing and temperatures. The topics considered not to be useful were keeping food safe on field trips and safe food handling for infants and toddlers primarily because most did not provide these services in their setting.

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CHAPTER I

INTRODUCTION

In 1990 30% of American children (≤5 years) received care in a setting outside of their home. The primary source of this care was from a licensed/registered child care provider (Parmley, 1992). By 1999 it is estimated that almost 80% of children will receive care outside of their homes (Veun and Gleason, 1991). This shift of care to outside of the home poses potential health risks to children for several reasons.

First, infants and children are identified as one of four population groups at "high risk" for foodborne illness (USDA, 1990). Infants and very young children (≤2 years) are vulnerable to foodborne illness due to their immature immune system (Food Insight, 1991). Their underdeveloped immune system limits their ability to fight infection; thus, they tend to develop more severe symptoms from exposure to foodborne pathogens than would an adult. Children in day care outside of their homes are reported to be at a 2-4 times higher risk to communicable diseases than are children not in day care outside of their homes.

A child care setting can be a reservoir of foodborne pathogens for many reasons: (1) storage, preparation, and serving of foods might be the responsibility of child care providers with inadequate training in safe food handling; (2) child care providers who diaper infants and assist children with toileting might also handle food

without following proper hygienic practices; (3) foods served in child care settings sometimes include those brought from home as well as those purchased or provided by the child care center or day care home; (4) some children attend day care even if they are ill due to the work constraints of their parent(s); and (5) children share eating utensils, dishes and toys, often after putting them in their mouth and/or on the floor, which increases the likelihood that pathogens could be transferred to other children. The food handling practices of child care providers influence risk to foodborne illness for children in the child care setting. This health risk necessitates the provision and assessment of current and accurate information about safe food handling for this important population -- child care providers.

This study was completed in three phases. During phase one, a needs assessment of Michigan child care providers was conducted to determine what providers wanted to learn about safe food handling and how they wanted to learn. In phase two, educational materials were developed. The materials were based on the needs assessment results and were consistent with the Michigan child care regulations. A model, based on the Health Belief Model, was also developed to evaluate the relationship between safe food handling knowledge, practices and perceptions.

The three research objectives, completed during phase three, were: (1) to determine the effect of the educational booklet entitled **What You Can't See Can Hurt Your Kids and You!** (Appendix A), on the safe food handling perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control; (2) to identify the relationship among safe food handling knowledge, practices and perceptions -- perceived susceptibility to foodborne illness,

perceived seriousness of foodborne illness, perceived benefits of handling food safely, perceived liability for causing foodborne illness, motivations to handle food safely and health locus of control; and (3) to determine the acceptability of the booklet to a sample of Michigan child care providers.

CHAPTER II

LITERATURE REVIEW

This chapter provides a review of the existing literature related to the objectives of this study and the corresponding research questions. The first section focuses on the need to provide safe food handling information to child care providers. The second section reviews existing food safety materials. The third section is a review of the Health Belief Model, the foundation for the evaluation component of this study.

Public health significance of safe food handling in the child care setting

A child attending a half-day (less than four hours) licensed/registered child care program typically receives one meal and one snack from the child care provider; a child attending a full-day program usually receives two meals and one snack (MDSS, 1989; MDSS, 1992). Usually the food is prepared on-site by providers who might not have been formally trained or who might have had limited or outdated training in safe food handling.

For most foodservice operations, the responsibility for prevention and control of foodborne illness is the responsibility of local government inspectors of the facility. The child care setting is the only type of foodservice operation not mandated by law to be inspected semi-annually by the local health agency to determine compliance with

the Michigan Foodservice Sanitation Code (Michigan Public Health Code, 1978). The licensing rules for both child care centers (MDSS, 1992) and family/group day care homes (MDSS, 1989) state that the facilities must be in compliance with the Michigan Foodservice Sanitation Code.

The only mandated inspection for family/group day care **homes** [a child care setting providing care for six or fewer unrelated children in a private residence (MDSS, 1989)] is for child care providers who choose licensure. Family/group day care homes are required to be registered but not licensed. The licensure process involves a four-hour workshop of which foods/nutrition is a small component. Registered family/group day care homes do not receive routine environmental health inspections. Licensed family/group day care homes receive one inspection immediately before licensure.

The licensing requirements for a child care center are different. A child care **center** is a child care setting other than a private residence, which receives one or more preschool or school age children for care for periods of less than 24 hours a day, and at which the parents or guardians are not immediately available to the children (MDSS, 1992). Centers are required to be licensed. Licensed child care centers (Table 1) receive an environmental health inspection every two years. The purpose of this inspection is to ensure compliance with the Michigan Child Care Organization Act (Act 116, P.A., 1973) and to evaluate the foodservice component of the center to determine if it is in compliance with the Michigan Foodservice Sanitation Code (Michigan Public Health Code, 1978). These inspections serve as a source of ongoing, accurate information for the child care provider about food safety. However,

frequency of these inspections is decreasing in Michigan due to budget constraints, therefore limiting the opportunity for government inspectors to interact with child care providers about the importance of, and recommendations regarding, safe food handling (Personal communication with Jacqueline Wood, 1994).

Potential food risks. Child care settings often provide food not commonly served in other types of foodservice operations -- infant formula, commercially prepared baby food, expressed mother's milk, and in some situations foods brought from home by the child. These types of food, like all foods, have been shown to be potential food safety risks due to unsafe handling. For example, powdered formula reconstituted with contaminated water or bottles could be a source of *Giardia lamblia*, *Cryptosporidium*, and *E. coli* (Benenson, 1990). Leftover baby food, if not properly refrigerated, could promote the growth of *Staphylococcus aureus* and other pathogens. Honey fed to very young children could be a source of *Clostridium botulinum* (Arnon et al., 1981). Educational materials need to teach providers how to safely handle foods unique to the child care setting as well as foods common to all foodservice settings.

The Licensing Rules for Family and Group Day Care Homes specifically allows for the use of home canned foods in family/group day care homes (MDSS, 1989). Other types of foodservice operations in Michigan are not allowed by law to serve home canned foods (Michigan Public Health Code, 1978). Improperly canned foods can be a source of *Clostridium botulinum*. The Licensing Rules for Family and Group Day Care Homes (MDSS, 1989) also state that home canned foods can be served if the preparer of the canned food has prepared the food according to current

Cooperative Extension Service (or equivalent) procedures. However, there is no way to know or test whether proper canning procedures were followed for canned foods. The evaluation of the canning process would be the responsibility of the child care provider.

The Licensing Rules for Family and Group Day Care Homes (MDSS, 1989) also permit the serving of unpasteurized milk to children, if the parents are notified. Unpasteurized milk can be a source of many pathogens which can cause mild to severe cases of foodborne illness. These pathogens include *Streptococcus*, *Campylobacter jejuni*, *Salmonella* sp., *Yersinia*, *Brucella*, and *Listeria monocytogenes* (Benenson, 1990).

Hygienic practices. The practice of diapering infants and preparing food without following appropriate sanitation/hygiene practices, improper preparation of infant formula and bottles, and improper food handling behaviors have been identified as factors that increase the risk of foodborne and communicable disease in child care centers (Pelto, 1991). Sullivan et al. (1984) reported that diapering and handling food by the same caregiver resulted in high rates of diarrhea among children in 736 licensed child care facilities in Texas. Training employees about correct handwashing procedures was shown to decrease the incidence of diarrhea (Black et al., 1981; Butz et al.,1990). Lack of appropriate personal hygiene before handling food in child care centers is a well documented mode of transmission for foodborne illness caused by *Cryptosporidium*, rotaviruses, *Giardia lamblia*, Hepatitis A virus, and *Shigella* (Benenson, 1990).

Training and educational materials about safe food handling. Sixty-one percent (61%) of California child care providers responding to a questionnaire assessing nutrition training needs rated food safety as a topic of interest (Direige et al., 1991). In California child care providers were shown to have a high interest in training about preventive health practices as it relates to child care facilities (Bassoff and Willis, 1991).

A review of existing food handling materials (Table 2) developed for child care providers indicated that no material(s) is comprehensive and appropriate regarding the uniqueness of the child care setting and rules itemized in the Michigan Child Organization Act (1973) and the Michigan Foodservice Sanitation Code (1978).

Table 1. Licensing statistics about Michigan child care providers.

Facility type	Facilities	Licensed child capacity	Regulatory agency[a]
Licensed child care centers[b]	3,992	191,177	MDSS, MDE MDPH
Licensed/registered[c] family/group day care homes	15,000	90,000[d]	MDSS, MDE

[a] MDSS is the Michigan Department of Social Services; MDPH is the Michigan Department of Public Health; MDE is the Michigan Department of Education.

[b] All child care centers in Michigan are required by law to be licensed by the MDSS. Licensed child care centers are inspected bi-annually by the MDPH and the MDSS. Licensed centers that participate in the Child and Adult Care Food Program are also regulated by MDE.

[c] Family/group day care homes are required by law to be registered with the MDSS. Licensure is optional. Licensed homes receive one inspection immediately before initial licensure.

[d] This number is inclusive of the number of children in licensed child care facilities.

Table 2. Food handling education materials developed for child care providers.

Title	Type	Content	Source
Adventures in Learning with the Food Guide Pyramid	Handbook	Meal planning Nutrition Food safety	Association for Child Development
Recommendations for Feeding	Handbook	Meal planning	MDE[a]
Preschool Children: Reference for Those Working with Young Children Extension		Nutrition	MDPH[b] MSU[c]
Model Education Project to Reduce Risk of Foodborne Illness in Child Care Centers and Family Day Care Homes	Videotape	Food handling Prevention of communicable disease Water Quality	Pennsylvania State University
Food Safety for Family Child Care Providers	Videotape Home lessons	Food handling	Kansas State University
Training Children about Food Safety: A Guide for Child Care Providers	Pamphlet	Handwashing	Iowa State University
Communicable Diseases in Child Care Settings	Brochure	Prevention of communicable diseases	MDPH[b]
Recommended Handwashing, Toileting, and Cleaning Procedures at Child Care Centers	Brochure	Handwashing	MDPH[b]
What You Can Do to Stop Disease in Child Day Care Centers: A Handbook for Caregivers	Handbook	Prevention of communicable diseases	DHHS[d]

Table 2 (continued). Food handling education materials developed for child care providers.

Title	Type	Content	Source
A Planning Guide for Foodservice in Child Care Centers	Handbook	Meal planning Nutrition	USDA[c]
What You Should Know about Contagious Disease in the Day Care Setting: A Handbook for Child Day Care Directors, Caregivers, and Parents	Handbook	Prevention of communicable diseases	DHSS[d]
Feeding Infants: A Guide for Use in the Child Care Food Program	Handbook	Meal planning Nutrition Food handling	USDA[c]
What's Cooking: A Collection of Recipes from Nebraska Day Care Home Providers	Handbook	Meal planning Food handling	Nebraska Department of Education Nebraska Cooperative Extension
Infant Formula Guide	Handbook	Handling infant formula Hygiene	American Dietetic Association
Child Care Health Handbook	Handbook	Prevention of communicable diseases	Seattle-King County Department of Public Health

Table 2 (continued). Food handling education materials developed for child care providers.

Title	Type	Content	Source
Food Safety Express	Videos Handbook	Safe food handling	University of Missouri Extension Service

[a] Michigan Department of Education
[b] Michigan Department of Public Health
[c] Michigan State University
[d] United States Department of Health and Human Services
[e] United States Department of Agriculture

Two widely distributed educational pamphlets targeting Michigan child care providers address handwashing (MDPH, 1985) and the identification of communicable diseases in child care settings (MDSS and MDPH, 1985) (Table 2). Neither pamphlet addresses food handling, only proper hygiene.

A set of handbooks developed for child care providers by the U.S. Department of Health and Human Services (DHSS, 1985) addresses handwashing and the identification of communicable disease but does not include information about prevention of foodborne illness by safe food handling. The USDA A Planning Guide for Foodservice in Child Care Centers allots only one of 34 pages to safe food handling (USDA, 1985). This is also true for the USDA Feeding Infants: A Guide for Use in the Child Care Food Program. Both handbooks focus primarily on nutrition and meal planning.

The American Dietetic Association (1988) has published a handbook to summarize the hazards associated with improperly preparing infant formula. The handbook, however, is written in a technical manner for health care professionals and not for the child care provider. Other commonly used sources of food handling information are based solely on the Michigan Foodservice Sanitation Code (MDPH, 1978) and do not address food handling of formula, prepared bottles, or commercially prepared baby foods.

Educational materials have not been identified that include information about the safety of foods, such as formula, prepared bottles, breast milk, commercial baby foods , and foods brought from home by the parent/guardian.

A needs assessment was not done before material development to determine the

preferred information needs and preferred methods of delivery for any of the materials listed in Table 2. Furthermore, none of the materials listed in Table 2 were evaluated to determine if the materials were acceptable to child care providers and if the materials were effective at improving safe food handling practices.

Researchers at Pennsylvania State University (Sigman, 1992) and Kansas State University (Kansas State University, 1992) have developed a videotape and home lessons to teach food handling principles to child care providers. General food handling principles, sanitation practices, and water quality are covered in each set of materials. These materials are not appropriate for Michigan child care providers because the information presented is not consistent with Michigan licensing rules for child care centers and family/group day care homes.

In Michigan two regulatory agencies (MDE and MDSS) develop newsletters to distribute to centers or homes. The MDE Child and Adult Care Food Program develops a bimonthly newsletter, Food Scoop, for distribution to all center and home sponsors. A sponsor is a non-profit organization that evaluates a child care center or family/group day care home to determine if they are in compliance with the requirements of the Child and Adult Care Food Program.

The MDSS develops a quarterly newsletter, Better Homes and Centers, which is distributed directly to all licensed/registered child care centers and family/group day care homes. However, each issue has a common theme which is not necessarily food safety. For instance, other themes include fire safety, electrical safety, and bookkeeping.

Many educational materials about safe food handling are available. However,

most do not provide information that is specific to the child care environment. Educational materials are needed that are consistent with the "food environment" of child care settings, with the two regulating codes, and that are understandable to child care providers. Accurate and comprehensive information about safe food handling, presented in an understandable and useable format, is needed to decrease the risk of foodborne illness of children enrolled in child care centers and family/group day care homes in Michigan.

Assessment of safe food handling

Most assessments of safe food handling have measured knowledge (cognitive domain) and practices (behavioral domain) (Albrecht et al., 1993; USDA, 1991; Williamson, 1992) rather than affective factors (values, beliefs, attitudes, perceptions, motivation). In each of these studies, knowledge about safe food handling was significantly correlated with safe food handling practices. The conclusion of these researchers was that educational interventions that increase knowledge about safe food handling can positively influence safe food handling practices. However, some social psychologists believe that behavior change might be dependent upon attitude change rather than knowledge change (Cohen, 1964; Wicker, 1971), therefore, an assessment of behavioral change after an educational intervention should include affective factors.

Measuring affective factors in conjunction with knowledge will provide more comprehensive information about their influence on behavior change. Schafer et al. (1993) found that affective factors significantly influenced positive food safety

practices. Measured factors included self-efficacy, the perception that unsafe food is or is not a personal health threat, the perception that one could or could not do something to reduce the threat, and the motivation to maintain good health; knowledge about food safety was not measured. These findings encourage the assessment of affective factors as a means to predict safe food handling behaviors.

When selecting factors that influence safe food handling, the three primary domains of information processing should be represented: affective (feelings and emotions including attitudes, beliefs, perceptions, motivations, and values), cognitive (knowledge), and behavior (practices) (Ray, 1973). A model should be developed to illustrate the relationship between cognitive, affective and behavioral factors being assessed.

Background of the Health Belief Model

Many studies about preventive health behavior have based their models on the principles of the Health Belief Model (Rostenstock, 1974). The Health Belief Model (HBM) attempts to explain why, in the absence of overt symptoms of illness, people engage in preventive health behavior. Preventive health behavior is defined as any activity undertaken by an individual for the purpose of preventing illness, detecting illness in an asymptomatic stage (Kasl and Cobb, 1966), or improving health (Rosenstock, 1974). Originally the HBM was developed to determine why some patients visit their doctor. Since then, the HBM has been applied to predict behaviors such as, visiting a doctor (Haefner and Kirscht, 1970), weight control (Sturhard, 1981), and food safety (Schafer et al., 1993).

The basic premises of the HBM are that for an individual to take health action to avoid an illness he would perceive: (1) he was personally susceptible to the illness; (2) the occurrence of the illness would have at least moderate severity on some component of his life; (3) taking health action would be beneficial by reducing his susceptibility to the illness or, if the illness occurred, by reducing its severity; and (4) taking action would not require overcoming psychological barriers such as embarrassment and cultural taboos (Figure 1) (Rosenstock, 1974).

Perceived susceptibility. Individuals are believed to vary widely in their perceptions of personal susceptibility to illness. For example, when studying individuals' perceived susceptibility to foodborne illness, one individual might deny any possibility of contracting foodborne illness. Another might admit to the "statistical" possibility of contracting foodborne illness, but believes that the probability is slim. While a third might express a feeling that he is at great risk of foodborne illness. Susceptibility is the perceived risk of personally contracting an illness. Perceptions of susceptibility will vary within an individual because perceptions of susceptibility are dependent upon the preventive health behavior and the associated illness being studied.

Perceived seriousness. Perceptions about the seriousness of an illness also vary between and within individuals. The degree of seriousness of an illness might be judged both by the degree of emotional arousal created by an individual's perception of the illness as well as by the difficulties the individual perceives a given illness will create for him.

The seriousness of an illness might be perceived in terms of its medical or

clinical consequences. For example, would contracting foodborne illness lead to death or just make the individual ill for a short time. On the other hand, some individual's perceptions of the seriousness of an illness might be based on the effects the illness would have on his job, his family life, and his social relations.

An individual's perceived susceptibility to and seriousness of an illness have a strong cognitive influence. This explains the variation of perceptions about an illness within an individual. Knowledge about an illness has the potential to modify an individual's perceptions (Haefner and Kirscht, 1970).

Perceived benefits of taking action and barriers to taking action. The perception that one is susceptible to an illness and the perception that the illness is serious are thought to influence taking health action. These perceptions do not, however, define the direction of action.

The direction of action is thought to be influenced by the individual's perceptions of the effectiveness of available methods (known by the individual) to reduce the threat of an illness. Taking action is likely to be seen as beneficial <u>if</u> it is perceived to reduce one's susceptibility to or to reduce the seriousness of contracting an illness. In addition, the individual's perceptions about the availability and effectiveness of health action, and <u>not</u> the objective facts about the effectiveness of the action, also influence if an individual will take health action. Furthermore, the norms and pressures of the social groups that an individual identifies with will also affect the perceptions about the benefits of a preventive health behavior.

On the other hand, an individual might believe that a behavior will be effective in reducing the threat of illness, but at the same time see that behavior as being

inconvenient, expensive, unpleasant, painful, or upsetting. Negative perceptions act as barriers to taking health action by arousing feelings of avoidance within an individual. If the readiness to act is high, the negative perceptions would be seen as relatively weak. If a child care provider perceives she and the children in her care are susceptible to foodborne illness and that foodborne illness is serious, she is more likely to throw out the leftovers from lunch rather than save them for tomorrow's lunch. If, on the other hand, she does not perceive she or the children are susceptible to foodborne illness and even if they were, it is not a serious illness, she might be less likely to apply safe food handling practices, such as throwing out leftovers that were cooled in a deep pan or sanitizing the countertops with a bleach and water solution.

The model suggests that when perceptions about the relationship between safe food handling practices and reducing one's susceptibility to foodborne illness are consistent with accurate information, the individual is highly oriented toward acting to reduce the likelihood or impact of the perceived danger from foodborne illness. If barriers to safe food handling practices are also great, the willingness to take action is more difficult to resolve. The individual is highly oriented toward acting to reduce the likelihood or impact of the perceived danger from foodborne illness. For example, a cook who left the ground beef needed for lunch on the countertop overnight might not throw out the meat because he/she will be reprimanded even though the individual knows that leaving meat on the countertop overnight increases the likelihood that bacteria could grow on the meat. A compensating (but compromising) practice might follow such as cooking the meat longer than usual.

Stimulus (or cues to take action). An individual might perceive he is susceptible to an illness, perceive that the illness is serious, and perceive that taking health action is beneficial. However, he might not take action.

Haefner and Kirscht (1970) attempted to increase people's readiness to visit their doctor by presenting them with messages about selected health problems. The messages were intended both to increase their perceived susceptibility and/or severity regarding the health problems and their beliefs in the efficacy of professionally recommended actions. Significantly more persons exposed to such messages visited a physician for a check-up in the eight months following the experimental manipulation than in a control group not exposed to the messages. This study, incidentally, provided evidence that it is possible to modify the perceived threat of disease; that it is the combination of perceived susceptibility to and severity of illness as well as the perceived efficacy of professional intervention, and that such modification can lead to predictable changes in health behavior.

Theoretically, educational materials about safe food handling could stimulate persons to handle food safely by increasing their willingness to take action. The materials would be effective if they modified these perceptions sufficiently to prompt an individual to handle food safely.

Other factors might also trigger the health action. These factors include health locus of control and motivation. To further improve the predictive power of the HBM, these factors were incorporated into the model (Figure 1). Hayes and Ross (1987) noted that many research studies applying the HBM focused primarily on the first component of the model -- readiness to take action against a health threat -- often to

the neglect of measuring the effect of modifying variables on the behavior.

Previous uses of the HBM focused exclusively on the illness being assessed and not on health in general. Becker et al. (1974) and Langlie (1977) identified value of health as a modifying variable because it represented differences in degree of concern about health in general. If an individual values health, he is probably more likely to take action.

Another modifying variable is "perceived health internal locus of control" or "powerlessness." Persons who view themselves as having some control over what happens to them are termed "internals"; persons who view that what happens to them is under the control of fate, luck, chance, or powerful others are termed "externals."

Internals have been shown to engage in behaviors that facilitate physical well-being (Dabbs and Kirscht, 1972; Straits and Sechrest, 1963; Williams, 1972). Type of educational intervention has been shown to interact with locus of control in determining outcomes. Most research suggests it might be useful to tailor interventions to individual differences in locus of control even though in this study the experimental groups did not perform significantly better than control groups.

Other variables. Measurement of demographics is also necessary to determine if personal characteristics, such as age, education, type of child care facility, number of years as a child care provider, have an influence on health action. Since perceived susceptibility and severity have a strong cognitive component, knowledge needs to be measured. However, the HBM places far less value on knowledge alone as an influencing factor of practices.

Based on this review of the literature, the following model was constructed

(Figure 2) as a proposed illustration of factors that might influence safe food handling practices.

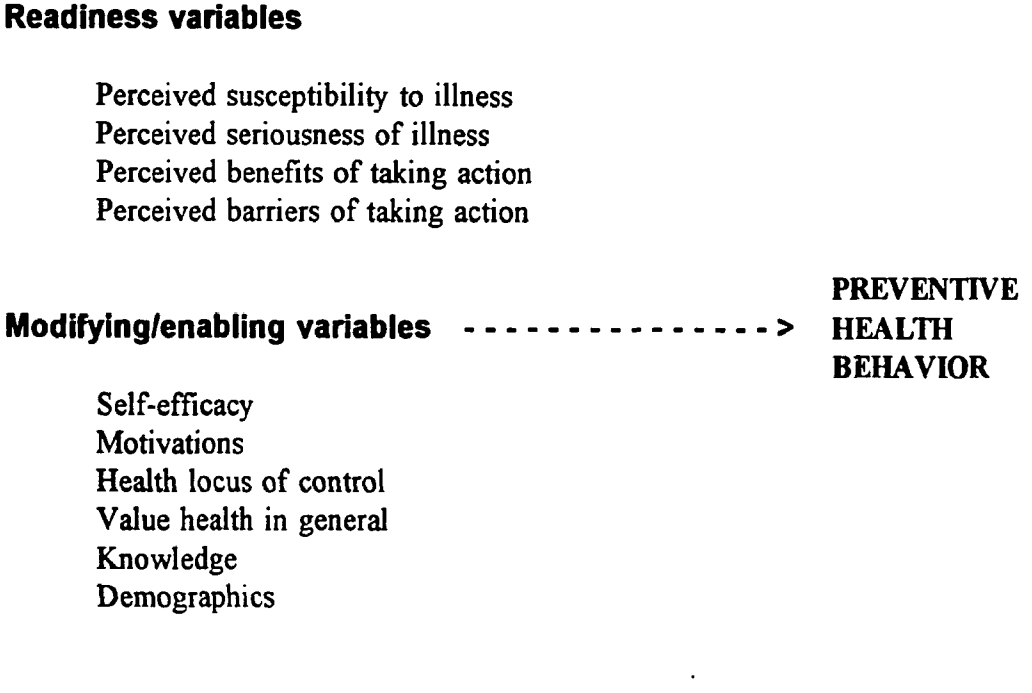


Figure 1. Framework for the Health Belief Model as proposed by Rosenstock (1974).

INDEPENDENT VARIABLES **DEPENDENT VARIABLE**

Demographics

Number of years work as a child care provider
Type of child care facility
Type of meals served

Perceived susceptibility to foodborne illness
Perceived seriousness of foodborne illness - > **SAFE FOOD HANDLING**
Perceived benefits of handling food safely **PRACTICES**
Perceived consequences of not handling food safely

Perceived importance of handling food safely
Health locus of control
Self-efficacy
Value on good health

Knowledge about safe food handling

Figure 2. Proposed model to assess safe food handling practices and factors that influence safe food handling.

CHAPTER III

METHOD

The three research objectives for this study were: (1) to determine the effect of the educational booklet entitled **What You Can't See Can Hurt Your Kids and You!** (Appendix A) on the safe food handling perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control; (2) to determine the relationship among safe food handling knowledge, practices and perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, perceived benefits of handling food safely, perceived liability for causing foodborne illness, motivations to handle food safely and health locus of control; and (3) to determine the acceptability of the booklet to a sample of Michigan child care providers. Research questions corresponding to the three objectives are as follows:

Objective 1

1. Does reading the booklet significantly change perceived seriousness of foodborne illness?
2. Does reading the booklet significantly change perceived susceptibility to foodborne illness?
3. Does reading the booklet significantly change health locus of control?

Objective 2

4. What factors influence the safe food handling perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control?

5. Is knowledge about specific safe food handling topics related to safe food handling practices?

Objective 3

6. Is the booklet acceptable to a sample of Michigan child care providers?

This study included three phases. The methods to complete each phase are described in this chapter.

PHASE ONE: ASSESSMENT OF THE SAFE FOOD HANDLING EDUCATIONAL NEEDS OF MICHIGAN CHILD CARE PROVIDERS

The first objective of phase one was to gather and assess information to develop an educational material to teach safe food handling to Michigan child care providers.

Formation of the advisory committee

An advisory committee was created consisting of representatives from the Michigan Departments of Social Services, Education and Public Health; Head Start; the Association for Child Development, a sponsor of the Michigan Department of Education (MDE) Child and Adult Care Food Program (CACFP); and the Michigan Community Coordinated Child Care Association, an advocacy group for child care

(Appendix B) and from the Departments of Food Science and Human Nutrition and Family and Child Ecology at Michigan State University. These representatives were selected for this advisory group because their organizations are responsible for: (1) enforcing Michigan child care regulations, (2) administering child care programs, or (3) providing training to child care providers. The functions of the advisory committee were: (1) to assist in the development and distribution of a needs assessment instrument; (2) to review the educational materials to determine if the format, language and content were appropriate for the target group; (3) to determine if the information was consistent with Michigan child care regulations; and (4) to use results of the study to improve safe food handling practices of Michigan child care providers.

Needs assessment

A needs assessment was conducted to determine what safe food handling topics care providers are interested in and to determine what format care providers like these materials to be in. A survey instrument was developed to assess the construct "safe food handling training needs" of teachers, program directors, foodservice personnel working in child care centers and of licensed/registered home providers. Four parallel forms of the instrument were developed for these four groups. The instrument contained demographic items, such as type of child care program; age ranges of children served; years of experience, age, gender and education of respondents; types of meals and snacks served by the center/home and site of food preparation. Other items assessed the primary sources of food handling information of the respondents,

safe food handling topics of interest to providers and preferred methods for learning about safe food handling. The information gathered from the needs assessment was used to develop the educational material.

The needs assessment instrument was reviewed for construct and content validity by a team of MSU researchers and the advisory committee. This expert review was conducted to determine whether the instrument 1) included items needed to assess the construct -- safe food handling training needs -- and 2) was appropriate for home and center providers regarding format and language. After suggested revisions were made, the instrument underwent a second round of expert review and revision. Changes in wording and sentence length were made. The revised instrument was assessed for readability using RightWriter (Que Corporation, 1991). The reading level of the final version of the instrument was grade six. Other readability indexes for the instrument were also assessed -- Flesch-Kincaid, Flesch and Fog. Acceptability of these indexes was determined by using guidelines established in the RightWriter manual (Que Corporation, 1991).

A letter, printed on letterhead from the MSU Department of Food Science and Human Nutrition, was developed to explain the purpose of the needs assessment, information about confidentiality, instructions for completion and a person or phone number to contact if clarification of instrument items or instructions were needed. This needs assessment research, including the survey instruments, was approved by the Michigan State University Committee on Research Involving Human Subjects.

Table 3. Indexes to assess readability of the booklet.

Index	Purpose	Acceptable range[a]	Value
Grade	Determines education level needed to read the document	4 - 8	7.28
Flesch	Supplements reading grade level	> 40	61.83
Fog	Used by educators	8 - 12	9.87
Strength	Measures if writing is clear and concise	0.5	0.84
Descriptive	Measures use of adjectives and adverbs	>0.2 and < 0.9	0.36

[a] Source: RightWriter manual (Que Corporation, 1991)

Needs assessment sample selection/respondents. Child care centers were randomly selected from the Department of Social Services roster which included all licensed child care centers in the State of Michigan. Four hundred and thirty-three (433) centers and 488 homes were selected in an attempt to achieve the recommended sample sizes of 354 centers and 358 homes to generalize the results to the populations of center providers and home providers (Krijcie and Morgan, 1970). Instruments, the cover letter and a return envelope were mailed "first class" during the week of March 15th, 1993 with a request for return by April 11, 1993.

Needs assessment results

The total number of respondents was 139 family/group day care home providers and 177 child care center workers (100 teachers; 22 foodservice workers; and 59 program directors). Background information related to both samples is presented in Tables 4 through 11. This information was used to develop the booklet and the evaluation instrument completed during phase three of this study.

Table 4. Demographic data of day care home provider respondents (n=139).

	Number (%)
Type of Program:	
Family day care home	105(77)
Group day care home	32 (23)
Age ranges of children cared for:[a]	
Birth to 12 months	93 (67)
1 to 2.5 years	116(83)
2.5 through 5 years	131(92)
6 years and older	88 (63)
Highest Level of Education:	
Some high school	4 (3)
High school graduate	53 (39)
Some college	53 (39)
College graduate	27 (20)
NIFI Certification:[b]	
NO	131(97)
Yes	4 (3)
Gender of Respondents:	
Female	139(100)
Male	0 (0)

[a] Respondents could select more than one category.

[b] Foodservice Operator Certification from the National Institute of the Foodservice Industry

Table 5. Demographic data regarding program type and employment categories of respondents working in child care centers (n=196).

	Number (%)[a]
Type of Program:[b]	
Full day care	61 (31)
Full day and B/A school care	50 (26)
Half-day care (not Head Start)	45 (23)
Head Start	19 (10)
Before/after (B/A) school care	14 (7)
Age ranges of children cared for:[b]	
Six weeks to 12 months	47 (24)
1 to 2.5 years	58 (30)
2.5 through 5 years	172(88)
6 years and older	73 (37)
Employment of Respondents:[b]	
Teacher/caregiver	100(58)
Program director	59 (31)
Foodservice worker/cook	22 (11)
Other	12 (6)
Years of Experience:	
Program director	8.0
Teacher/caregiver	5.8
Foodservice worker/cook	4.7
Age of respondents	
Foodservice worker/cook	42.9
Program director	38.2
Teacher/caregiver	35.8

[a] Percents were calculated as the number selecting the response divided by the total number of respondents (n=196).

[b] Respondents could select more than one category.

Table 6. Demographic data of three categories of respondents working in child care centers (n=196).

	Number (%)[a]		
	Teachers (n=100)	Directors (n=59)	Foodservice (n=22)
Highest Level of Education:			
Some high school	0 (0)	0 (0)	0 (0)
High school graduate	21 (21)	0 (0)	9 (41)
Some college	26 (26)	3 (5)	6 (27)
College graduate	52 (52)	56 (95)	7 (32)
NIFI Certification[b]:			
No	93 (99)	56(100)	15 (75)
Yes	1 (1)	0 (0)	5 (25)
Gender of Respondents:			
Female	99(100)	56 (97)	20 (91)
Male	0 (0)	2 (3)	2 (9)

[a] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

[b] Foodservice Operator Certification from the National Institute of the Foodservice Industry

Table 7. Foodservice tasks of day care home providers (n=139).

Foodservice task	Number (%)
Day care home providers (n=139)	
Prepare food for children	137 (99)
Serve food to children	135 (97)
Clean eating area	135 (97)
Store leftover foods	133 (96)
Sit with children during meals	127 (91)
Do not prepare/serve food	0 (0)

Table 8. Foodservice tasks of teachers, program directors, and foodservice workers within child care centers (n=196).

Foodservice task	Number (%)[a]		
	Teachers (n=100)	Directors (n=59)	Foodservice (n=22)
Sit with children during meals	86 (86)	29 (49)	7 (32)
Serve food to children	85 (85)	30 (51)	14 (64)
Clean eating area	82 (82)	26 (44)	9 (41)
Prepare food for children	61 (61)	21 (36)	20(91)
Store leftover foods	53 (53)	18 (30)	17 (78)
Do not prepare/serve food	9 (9)	20 (34)	1 (5)

[a] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

Table 9. Meals and snacks regularly served and site of food preparation in day care homes (n=139) and child care centers (n=196).

Type of Meal Served[a]	Prepared on-site (%)[b]	Brought from home (%)
Family/group day care homes		
Lunch	99	6
Afternoon snack	96	2
Breakfast	93	2
Morning snack	70	3
Supper/dinner	25	0
Evening snack	16	0
No meals	0	82
Child care centers		
Afternoon Snack	149 (76)	32 (16)
Morning snack	114 (58)	24 (12)
Breakfast	85 (44)	10 (5)
Lunch	68 (35)	62 (32)
Evening snack	7 (4)	0 (0)
Supper/dinner	5 (3)	2 (1)
No meals	25 (13)	93 (47)

[a] Respondents could select more than one category.

[b] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

Table 10. Primary[a] sources of food handling information of day care home providers (n=139).

Information source	Response frequency (%)[b]
Child Care Food Program	81
Newspapers/magazines	44
Family members or friends	31
Department of Social Services	28
Local/state 4C agency	23
Other care providers	17
Local/state health department	17
Radio/television	16
Other	12
Cooperative Extension Service	9
College courses	5
Local school district	4
Community education courses	4
Professional organizations	2
Dairy Council	2

[a] Respondents were requested to select their three primary sources of food handling information.

[b] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

Table 11. Primary sources[a] of food handling information of child care center teachers, foodservice workers, and program directors.

	Number (%)[b]			
Information Source	Total sample	Teachers	Directors	Foodservice
Local/state Health Department	93 (47)	42 (42)	35 (18)	9 (41)
Department of Social Services	85 (43)	46 (46)	34 (17)	2 (9)
Employer	63 (32)	44 (44)	4 (2)	13 (59)
Co-workers	44 (22)	27 (27)	6 (3)	11 (50)
College courses	31 (16)	11 (11)	16 (8)	2 (9)
Family members or friends	31 (16)	19 (19)	5 (3)	6 (3)
Local school district	25 (13)	12 (12)	6 (3)	4 (18)
Cooperative Extension Service	25 (13)	10 (10)	9 (15)	1 (5)
Professional organizations	23 (12)	10 (10)	8 (4)	2 (9)
Newspapers/magazines	18 (9)	7 (7)	10 (5)	1 (5)
Local/state 4C agency	15 (8)	6 (6)	8 (4)	1 (5)
Dairy Council	12 (6)	6 (6)	3 (2)	1 (5)
Other	11 (6)	4 (4)	5 (3)	2 (9)
Community education courses	6 (3)	5 (5)	0 (0)	1 (5)
Radio/television	6 (3)	2 (2)	2 (1)	1 (5)

[a] Respondents were requested to select their three primary sources of food handling information.

[b] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

Table 12. Level of interest[a] of day care home providers (n=139) regarding food handling topics.

Topics	Response frequency (%)[b]
Food-related causes of illness in day care homes:	
Very Interested	60
Not interested	6
Identification of unsafe food:	
Very interested	55
Not interested	13
Reasons food becomes unsafe:	
Very interested	50
Not interested	21
Food safety regulations for day care homes:	
Very interested	43
Not interested	14
Proper hygiene practices for day care homes:	
Very interested	40
Not interested	24
Kitchen sanitation:	
Very interested	38
Not interested	22
Food safety between prep/serving:	
Very interested	37
Not interested	24
Proper food transport (field trips):	
Very interested	33
Not interested	27

Table 12 (continued). Level of interest[a] of day care home providers (n=139) regarding food handling topics.

Topics	Response frequency (%)
Food storage recommendations:	
Very interested	32
Not interested	23
Pest control:	
Very interested	24
Not interested	36

[a] Response choices included: very interested, somewhat interested, not interested.

[b] Percents were calculated as the number who selected the response divided by the total number within the population.

Table 13. Level of interest[a] of child care center teachers, foodservice workers and program directors regarding food handling topics.

	Number (%)[b]			
Information Source	Total sample	Teachers	Directors	Foodservice
Food safety regulations for CCC:				
Very interested	109(61)	53(57)	34(62)	12(67)
Not interested	11 (6)	5 (5)	4 (7)	1 (6)
Food-related causes of illness in CCC:				
Very interested	99(57)	56(61)	26(49)	8(47)
Not interested	15 (9)	7 (7)	7(13)	1 (6)
Proper hygiene practices for CCC:				
Very interested	89(52)	47(53)	27(52)	9(50)
Not interested	10 (6)	4 (5)	3 (6)	2(11)
Identification of unsafe food:				
Very interested	85(49)	44(49)	24(44)	10(59)
Not interested	24(14)	13(15)	9(17)	2(11)
Reasons food becomes unsafe:				
Very interested	69(40)	36(40)	17(31)	10(59)
Not interested	23(13)	13(15)	9 (16)	1 (6)
Food safety between prep/serving:				
Very interested	62(34)	30(32)	15(27)	10(59)
Not interested	36(20)	17(18)	15(27)	1 (6)
Food storage recommendations:				
Very interested	53(31)	27(31)	13(25)	8(50)
Not interested	45(26)	26(29)	14(26)	1 (6)
Kitchen sanitation:				
Very interested	53(31)	27(31)	15(29)	8(47)
Not interested	47(28)	30(34)	14(27)	2(12)

Table 13 (continued). Level of interest[a] of child care center teachers, foodservice workers and program directors regarding food handling topics.

	Number (%)[b]			
Information Source	Total sample	Teachers	Directors	Foodservice
Pest control:				
Very interested	40(24)	23(26)	7(13)	6(38)
Not interested	48(28)	30(34)	13(24)	5(31)
Proper food transport (field trips)				
Very interested	36(21)	19(21)	9(17)	5(29)
Not interested	65(38)	36(40)	22(42)	4(24)

[a] Response choices included: very interested, somewhat interested, not interested.
[b] Percents were calculated as the number who selected the response divided by the total number within the subpopulation.

Table 14. Food handling educational methods preferred by day care home providers (n=139)

Methods	Response frequency (%)[b]
Newsletter:	
Very useful	78
Not useful	3
Booklet:	
Very useful	69
Not useful	4
Fact sheets:	
Very useful	63
Not useful	3
Videotapes:	
Very useful	57
Not useful	12
900 or 800 hotline number:	
Very useful	48
Not useful	11
Informational posters:	
Very useful	46
Not useful	26
Audio tapes:	
Very useful	36
Not useful	25
Satellite conference (evening):	
Very useful	29
Not useful	29

Table 14 (continued). Food handling educational methods preferred by day care home providers (n=139).

Methods	Response frequency (%)
Evening workshop:	
Very useful	24
Not useful	29
NIFI Certification:[a]	
Very useful	22
Not useful	34
Saturday workshop:	
Very useful	22
Not useful	39
Satellite conference (daytime):	
Very Useful	16
Not useful	48
Morning workshop:	
Very useful	3
Not useful	84
Afternoon workshop:	
Very useful	2
Not useful	84

[a] Foodservice Operator Certification from the National Institute of the Foodservice Industry

[b] Percents were calculated as the number who selected the response divided by the total number within the population.

Table 15. Food handling educational methods preferred by child care center teachers, foodservice workers and program directors.

Methods	Total Sample (n=196)	Teachers (n=100)	Directors (n=59)	Foodservice (n=22)
Booklet:				
Very useful	136(75)	70(74)	43(77)	12(67)
Not useful	7 (4)	4 (4)	2 (4)	1 (6)
Fact sheets:				
Very useful	130(72)	64(70)	43(77)	11(58)
Not useful	4 (2)	3 (3)	0 (0)	1 (5)
Newsletter:				
Very useful	128(71)	56(63)	44(77)	16(80)
Not useful	9 (5)	8 (9)	0 (0)	1 (5)
Informational posters:				
Very useful	111(66)	53(62)	35(69)	13(65)
Not useful	13 (8)	5 (6)	7(14)	1 (5)
Videotapes:				
Very useful	95(56)	43(48)	35(66)	9(53)
Not useful	21(12)	12(14)	5 (9)	2(12)
900 or 800 hotline number:				
Very useful	61(38)	28(33)	20(39)	6(35)
Not useful	32(20)	15(18)	12(24)	4(24)
Audio tapes:				
Very useful	50(31)	19(23)	20(41)	5(31)
Not useful	48(30)	25(30)	13(26)	6(38)
NIFI Certification:[a]				
Very useful	24(17)	11(15)	6(14)	5(31)
Not useful	63(44)	34(47)	24(55)	3(19)
Afternoon workshop:				
Very useful	19(12)	8(10)	7(14)	1 (6)
Not useful	83(52)	44(52)	25(49)	9(56)

Table 15 (continued). Food handling educational methods preferred by child care center teachers, foodservice workers and program directors.

Methods	Total Sample (n=196)	Teachers (n=100)	Directors (n=59)	Foodservice (n=22)
Evening workshop:				
Very useful	17(11)	7 (8)	5(10)	4(24)
Not useful	87(55)	45(54)	28(58)	9(53)
Morning workshop:				
Very useful	16(10)	6 (7)	7(15)	1 (6)
Not useful	100(63)	51(59)	32(67)	13(81)
Satellite conference (daytime):				
Very Useful	15(10)	5(6)	6(12)	0(0)
Not useful	107(70)	54(69)	37(76)	13(81)
Saturday workshop:				
Very useful	14 (9)	7(9)	3(6)	2(12)
Not useful	107(69)	53(67)	36(74)	13(76)
Satellite conference (evening):				
Very useful	11 (7)	6(7)	4(8)	0(0)
Not useful	97(63)	49(61)	34(69)	11(69)

[a] Foodservice Operator Certification from the National Institute of the Foodservice Industry

Results indicated that persons who care for young children in licensed day care homes (Table 12) and in child care centers (Table 13) wanted to know more about the relationship between food and illness. Specifically, they wanted information about how food becomes unsafe and how to prevent foodborne illness in the child care environment. Providers in both day care homes (Table 14) and child care centers (Table 15) preferred print materials (booklets, fact sheets or newsletters) to videotapes, audiotapes, workshops, teleconferences, or an information hotline.

PHASE TWO: DEVELOPMENT OF THE MODEL, THE BOOKLET AND THE EVALUATION INSTRUMENT

The objectives of phase two were: (1) to develop a theoretical model to identify the relationship between safe food handling knowledge, practices and perceptions; (2) to develop a booklet teaching safe food handling to child care providers; (3) to develop an evaluation instrument to determine the effect of the booklet; and (4) to identify the relationship between safe food handling knowledge, practices and perceptions.

Development of the theoretical model

A theoretical model (Figure 3) was developed to identify the relationship between safe food handling knowledge, practices and perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control. The Health Belief Model described in **CHAPTER II, LITERATURE REVIEW**, was the basis for the model because it provided a

framework for analyzing safe food handling perceptions and it is well accepted as a predictor of health-related practices, such as safe food handling. In fact, use of the Health Belief Model has also been shown to predict food safety behavior (Schafer et al., 1993). The Health Belief Model was selected as the foundation of this researcher's model for two reasons. (1) It was impossible to measure every factor that would be part of this relationship, therefore, this researcher needed to select factors. (2) The researcher wanted to study those variables which explain the most variance in the outcomes of interest.

The model proposed by this researcher in Figure 3 is a revision of the one appearing in Figure 2 (**CHAPTER II, LITERATURE REVIEW**). Originally, the effect of the booklet was to be determined by change in the three perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control -- and safe food handling practices. However, the literature reports that the effect of print materials is generally limited to changing perceptions, not practices (Atwood et al., 1991; Hughes et al., 1993; Lieu et al., 1991). The administration of the evaluation instrument, which is discussed later in this chapter, was also not conducive to measuring change in practices. Therefore this researcher determined it was more appropriate to evaluate change in perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control -- and factors influencing their change rather than to evaluate change in safe food handling practices.

Operational definitions of the measurement domains and factors represented in the model are listed in Appendix C. The process of selecting factors to include in the

model was based on the existing literature and conversations with child care providers working in both day care homes and child care centers. The conversations were informal exchanges after two safe food handling presentations made by this researcher during the summer of 1994. **CHAPTER II, LITERATURE REVIEW** contains a detailed discussion of the theoretical foundation of the model.

Independent variables (pretest)	**Dependent variables (posttest)**
Years of experience as a child care provider	
Safe food handling knowledge	
Perceived benefits of handling food safely	Perceived seriousness of foodborne illness
Perceived motivations to handle food safely	Perceived susceptibility to foodborne illness
Perceived liability for causing foodborne illness	Health locus of control
Health locus of control	
Perceived susceptibility to foodborne illness	
Perceived seriousness of foodborne illness	
Safe food handling practices	

Figure 3. A model to identify the relationship between safe food handling knowledge, practices and perceptions.

Development of the booklet

Both day care home providers and child care center workers responding to the needs assessment survey reported they preferred to receive safe food handing information in the form of a booklet, fact sheets or a newsletter (Tables 14 and 15 respectively). Since the effect of information in a newsletter was considered more difficult to evaluate, a booklet that was a compilation of fact sheets was developed.

The booklet **What You Can't See Can Hurt Your Kids and You!** (Appendix A) is a series of ten fact sheets with each fact sheet explaining how to prevent foodborne illness during a different food handling situation. The fact sheet topics include Michigan child care regulations, foodborne illness, unsafe foods, storing foods, cooking, cleaning up, snack and meal time, field trips and caring for infants and toddlers.

Safe food handling topics for the booklet were identified by a team of MSU researchers, including this researcher and the advisory committee (Appendix B). The most common causes of foodborne illness (CDC, 1990), the food handling requirements within the Michigan regulations for child care centers (MDSS, 1992; MDPH, 1978) and family/group day care homes (MDSS, 1989; MDPH, 1978), input from the advisory committee and results from the needs assessment were used as a basis for selecting these topics. The safe food handling topics included: identification of unsafe foods, proper storage methods, proper food temperatures, sources of microbiological contamination, prevention of cross-contamination, proper handwashing, proper methods to sanitize surfaces or dishware and infant feeding.

Readability of the booklet was assessed using RightWriter (Que Software,

1991). The reading grade level of the booklet was grade 7.28. A reading level of grade six or seven was recommended by the advisory committee as appropriate for the target population -- Michigan child care providers. Other readability indexes conducted were: Flesch Index (61.83), Fog Index (9.87), strength index (0.84) and descriptive index (0.36). A brief description of acceptable ranges for these readability indexes is presented in Table 3.

Development of the evaluation instrument

Objectives of the pretest and posttest. Factors measured on the pretest are shown in Table 16 and are based on the model shown in Figure 3. The objective of the pretest (Appendix D) was to gather data to determine the relationship between safe food handling knowledge, practices and perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, perceived benefits of handling food safely, perceived liability for causing foodborne illness, motivations to handle food safely and health locus of control. Data collected from the pretest were used to answer research questions 4 and 5.

Factors measured on the posttest are also listed in Table 16. The objectives of the posttest (Appendix E) were to gather data to determine: (1) if mean scores for the perceptions -- perceived seriousness of foodborne illness, perceived susceptibility to foodborne illness and health locus of control -- changed after the child care provider read the booklet; (2) the relationship between safe food handling knowledge, practices and perceptions and (3) if the booklet was acceptable to a sample of Michigan child care providers. Data collected from the posttest was used to answer research

questions 1, 2, 3 and 6.

Table 16. Factors measured on the pretest and posttest.

Pretest	Posttest
Demographics	NA[a]
Safe food handling knowledge	NA
Safe food handling perceptions	Safe food handling perceptions
Perceived seriousness of foodborne illness	Perceived seriousness of foodborne illness
Perceived susceptibility to foodborne illness	Perceived susceptibility to foodborne illness
Health locus of control	Health locus of control
Perceived benefits of handling food safely	NA
Motivations to handle food safely	NA
Perceived liability for causing foodborne illness	NA
Safe food handling practices	Safe food handling practices[b]

[a] NA = not measured on the posttest
[b] Data collected, but not analyzed.

Assessment of the validity and reliability of the evaluation instrument

Construct and content validity. Construct and content validity of the instrument were assessed by a panel of Michigan State University faculty. These faculty had expertise in food safety, education and evaluation. They reviewed each item for clarity of language, appropriateness of language for child care providers, freedom from clues in the response choices and accuracy in content. The instrument was determined to have both construct and content validity.

Reading grade level. The readability of all items was grade 5.75 (Table 3). It was assessed using the software, RightWriter (Que Software, 1991). The advisory committee (Appendix B) had recommended a grade 6 or 7 reading level for evaluation items. Other readability indexes used were Flesch Index (74.28), Fog (7.19), Strength (0.79) and Descriptive (0.5). All of these values were within recommended ranges (Que Software, 1991).

Focus group evaluation of the instrument

The language and format of the instrument were evaluated by three different groups of center providers (total number of providers in all three focus groups equals 25) working in three Lansing area child care centers during a focus group interview. The selection of child care providers to include in the focus groups was based on willingness of the center to allow these focus groups.

Each provider was given a copy of the instrument one week before the focus group interview. They were asked to complete it and record any comments or problems that they found related to understanding the instructions, the language and

the format of the instrument.

During the three interviews (each lasted approximately one hour), providers were asked for their feedback. The general comments of all three focus groups were that: the questions were very redundant (due to parallel items to assess different variables), the survey was too lengthy and needed to be shorter so respondents would be more thoughtful when answering questions, and that the "original" scale of 0-10 to measure perceptions was too broad making it difficult to determine one's level of agreement.

Upon reviewing the instrument it was apparent that the wording of knowledge items was almost identical to the wording for items measuring the safe food handling practices. To decrease the redundancy, the item stems for knowledge questions were rewritten. The response format of *true*, *false* and *I don't know* for the item stems was also changed to include four response choices per item.

Items measuring three factors were deleted from the survey -- importance of handling food safely, value of good health and self-efficacy -- to shorten the survey. These factors are shown in the model proposed in Figure 2. The scale of measurement for items measuring the six remaining perceptions was changed from 0 to 10 to a scale of 0 to 5.

Format of the evaluation items

A description of item format and response scales for the factors measured in this study are described below.

Demographics. Demographics were assessed on the pretest. A series of

closed-ended items were written to identify characteristics of the day care home providers and child care center teachers. Years of experience, meals served, if care for infants, use of a dishmachine or three-compartment sink were asked of both groups. Day care home providers were also asked if they served home-canned foods; child care center teachers were not asked because centers are not allowed to serve home canned foods.

Safe food handling practices. Safe food handling practices were measured on the pretest and the posttest (Table 16). The construct "safe food handling" was characterized by seven practices: identification of unsafe foods, proper handling of unsafe foods, proper food temperatures; proper storage of food, proper sanitizing of surfaces and dishware, prevention of cross-contamination and proper handwashing. These practices were assessed because they relate to foodborne illness (CDC, 1990).

One or more items were written to measure each of the seven practices. Respondents were asked to record a number between 0% and 100% after each item to indicate how often they applied the practice. Eight (8) practice items were on the pretest developed for child care center teachers; eleven additional practice items were included on the pretest developed for day care home providers for a total of 19 practice items. The difference in the number of items between the two groups was due to a wider range of food handling situations consistent with the providers care situation -- storage, preparation, cooking, reheating, serving and sanitizing.

Posttest practice mean scores -- total and item -- were not calculated and thus were not used for statistical analyses. Change in practices is purported to take time (Flay et al., 1980). The responses to posttest practice items were assumed to represent

intent to change practices rather than actual change in practices because there was no control over how soon after reading the booklet the respondent did complete the posttest. Therefore, change in practices was not assessed since posttest practice scores cannot be assumed to truly represent change in practices based on reading the booklet.

Safe food handling knowledge. Safe food handling knowledge was measured on the pretest to determine its relationship to the perceptions -- perceived seriousness of foodborne illness, perceived susceptibility to foodborne illness and health locus of control (Table 16). One or more items were written to measure each of the seven safe food handling topics included in the booklet. Knowledge items were multiple choice items with four response choices. Four response choices were considered to be the most discriminating (Green, 1979). Respondents were asked to only answer the item if in their child care setting the service was provided (Appendix D).

The pretest developed for child care center teachers had nine items. The pretest developed for day care home providers had seven additional items -- for a total of 16 knowledge items. The difference in the number of items was due to a wider range of food handling situations consistent with the providers care situation -- storage, preparation, cooking, reheating, serving and sanitizing. Input from the advisory committee (Appendix B) and results from the needs assessment (Table 9) indicated that day care homes generally serve a wider range of meals than centers.

The 16 knowledge items were pilot tested with 28 day care home and child care center teachers attending a workshop sponsored by the Michigan Department of Education Child and Adult Care Food Program. Item analysis -- difficulty index,

percent of respondents selecting the correct answer; discrimination index, percent of high scorers (masters) who selected the correct answer minus percent of low scorers (non-masters) who selected the correct answer; and a Kuder Richardson-20 (KR-20) coefficient, a measure of internal consistency among items -- was conducted by the Michigan State University Computer Center Scoring Office. The difficulty index for knowledge items was 70%, the discrimination index was .32 and the KR-20 coefficient was .30 (Table 17).

An item analysis was also performed on knowledge scores from a random sample of 41 respondents participating in this study (Table 18) to cross-check the results from the first item analyses. Individual item variances, the difficulty index (71%) and a KR-20 coefficient (-.10) were calculated using SPSS for Windows 6.1 (SPSS for Windows, 1995). A discrimination index was not calculated because SPSS for Windows 6.1 (SPSS for Windows, 1995) does not have the ability to calculate a discrimination index.

Guidelines recommend a KR-20 coefficient of .70 or higher as an indicator of a reliable scale. Neither KR-20 coefficient (.30 and -.10) was acceptable as determined by these guidelines. Therefore, further review of the coefficients was performed.

To interpret these two KR-20 coefficients, the KR-20 formula was reviewed: as:

$$(k/k-1)\ (1-\Sigma\sigma_i^2/\sigma_t^2)$$

where:

k = number of items
σ_i^2 = population variance of each item
σ_t^2 = population variance of total knowledge scores

Since the population variance of each item and the population variance of the total knowledge score are the bases of the KR-20 coefficient, item variances were calculated for a randomly selected sample of 41 day care home providers participating in this study. Scores from day care home providers were used because this group received all fifteen knowledge items, whereas child care center teachers received eight items.

Upon reviewing the item variances, it was noted that the relationship between the difficulty of the item (the number of respondents who had answered the item correctly) and the variance of the item was nearly perfectly inverse. More difficult items had a larger variance. It, therefore, appears that to achieve an acceptable KR-20 coefficient items cannot be too difficult and their level of difficulty needs to be similar. This researcher believed it was important to include difficult knowledge items on the pretest. The more difficult knowledge items measured concepts found directly in the regulations for child care centers and family/group day care homes. It was important to include these items to get an accurate portrayal of safe food handling knowledge concepts that are required by law for this population.

Table 17. Item analyses results of knowledge items for a sample of day care home providers and child care center teachers attending a Michigan Department of Education Child and Adult Care Food Program conference (n=28).

Item no.	Construct	Difficulty index	Discrimination index
1	Sanitizing diapering table	83	36
2	Infant formula at room temperature	29	-9
3	Feeding infants from a jar	95	18
4	Identification of safe leftovers	46	46
5	Safe cooling methods	73	46
6	Purpose of cooking	93	27
7	Sanitizing methods	85	-9
8	Handwashing methods	90	27
9	Items to sanitize	90	18
10	Storage of packaged food	88	27
11	Reserving leftovers	78	36
12	Washing produce	90	9
13	Identifying safe food	66	36
14	Indicators of unsafe food	88	27
15	Identification of unsafe food	98	0
16	Refrigeration temperatures	20	-9

Table 18. Item analyses results of knowledge items from a randomly selected subsample of 41 respondents participating in this study.

Item no.	Construct	Difficulty index	Item variance
1	Sanitizing diapering table	69	22
2	Infant formula at room temperature	33	22
3	Feeding infants from a jar	87	12
4	Identification of safe leftovers	40	24
5	Safe cooling methods	39	24
6	Purpose of cooking	86	12
7	Sanitizing methods	82	15
8	Handwashing methods	94	6
9	Items to sanitize	92	7
10	Storage of packaged food	88	10
11	Reserving leftovers	71	21
12	Washing produce	92	7
13	Identifying safe food	74	19
14	Indicators of unsafe food	91	8
15	Identification of unsafe food	55	25
16	Refrigeration temperatures	24	31

The other way to improve the KR-20 coefficient is to increase the number of items making up the scale. Shorter scales are generally recognized as less reliable than are longer scales, with all other things being equal. The Spearman-Brown "prophecy" formula can be used to predict the reliability of a knowledge scale if more items are added to the scale (Fitz-Gibbon and Morris, 1987).

Safe food handling perceptions. Safe food handling perceptions were measured on the pretest and on the posttest (Table 16). Six perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, perceived benefits of handling food safely, perceived motivations to handle food safely, perceived liability for causing foodborne illness and health locus of control -- were measured on the pretest and are defined in Appendix C. Three perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control -- were measured on the posttest to determine if their mean scores changed after providers read the booklet.

Each perception was measured by two or more items. A scale of 0 (no agreement) to 5 (complete agreement) was used to assess the level of agreement with the item. This scale was selected because it is numerical, rather than ordinal, so inferential statistical analyses could be conducted.

Acceptability of booklet. A series of closed and open-ended items were part of the posttest developed for both day care home providers and child care center teachers. The purpose of these items was to identify, by self-reporting, if the booklet was read by the child care provider and if the booklet was acceptable in terms of ease of reading, format and content.

PHASE THREE: EVALUATION OF THE MODEL AND THE BOOKLET

Subjects

Michigan child care providers within the four primary types of licensed/ registered child care programs (Head Start, child care centers, family/group day care homes and before/after school programs) were targeted in this study.

Sample selection. Two samples of subjects were randomly selected. The first sample of 1000 family/group day care home providers was selected from a 1992 Michigan Department of Social Services (MDSS) list of 15,018 home providers licensed/registered to provide care to children in Michigan (Health and Welfare, 1992). The second sample was 1000 child care centers selected from a 1993 list of the 3,992 child care centers licensed in Michigan (Health and Welfare, 1993). Every 15th home was selected from the list of day care home providers and every fourth home was selected from the list of centers to comprise the two random samples of Michigan child care providers. The same lists were used to select the sample for the needs assessment. If the home or center had been selected for the needs assessment sample, the next name on the list was selected instead.

The selection of which teacher working in the center was selected to complete the survey was determined by the center director. In the letter explaining the study to the child care center director, the center director was requested to ask one teacher in the center to participate in this study. The director was instructed to select a teacher whose job responsibility included serving food to the children.

Research Design. The Solomon Four-Group Design shown in Table 19 was used as the research design to collect and analyze the data (Campbell and Stanley,

1963). The Solomon Four-Group Design was selected because it controls for the external threats to validity of pretesting and reading the booklet and all other threats to internal validity (Appendix F). Controlling for the effect of pretesting and reading the booklet was essential to making valid conclusions about change in mean scores for perceptions (research questions 1-3). Pretesting might increase or decrease the respondent's sensitivity or responsiveness which could threaten the validity of the posttest results.

Definition of the four groups in the Solomon Four-Group Design. The four groups making up this research design are described below and are listed in Table 19. The pretested experimental group (1) completed the pretest, were instructed to read the booklet and completed the posttest. The pretested control group (2) did not receive the booklet but completed the pretest and the posttest at the same time as the experimental group. The nonpretested experimental group (3) did not complete the pretest but were instructed to read the booklet and completed the posttest. The nonpretested control group (4) did not complete the pretest and did not read the booklet but did complete the posttest at the same time as the other three groups. Subjects within the two samples were randomly assigned to one of the four groups.

Table 19. Research design and sample size of Michigan child care providers.

Group		Pretest	Received booklet	Posttest	Sample size
Family/group day care homes					
1	R:Pretested experimental	0[a]	X[b]	0	600
2	R:Pretested control	0		0	100
3	R:Nonpretested experimental		X	0	200
4	R:Nonpretested control			0	100
	TOTAL				1000
Child care center providers					
1	R:Pretested experimental	0	X	0	600
2	R:Pretested control	0		0	100
3	R:Nonpretested experimental		X	0	200
4	R:Nonpretested control			0	100
	TOTAL				1000

[a] 0 = Assessment
[b] X = Intervention

Sample assignment to groups. Sample assignment to groups was random so that the assumption could be made that the four groups for both samples were not different. The names (day care home provider or child care center) selected from each MDSS list were each continuously numbered 1 through 10 until all were assigned a number. The providers with numbers 1 through 6 were assigned to the pretested experimental group (1); those with number 7 were assigned to the pretested control group (2); those with numbers 8 and 9 were assigned to the nonpretested experimental group (3); and those with number 10 were assigned to the nonpretested control group (4). This system was used because the total sample sizes different between the experimental and control groups and the pretested and the nonpretested groups.

Data Collection

Data were collected using procedures described by Babbie (1991) and Alreck and Settle (1995). The procedures and timeline for data collection are described in detail in Appendix G. All instruments, cover letter and addressed return envelope were mailed "first class."

One follow-up mailing, consisting of a reminder postcard, was sent to nonrespondents to the pretest to increase the response rate to the pretest. A second follow-up mailing was not done because the first mailing of the posttest was taking place when the second follow-up mailing would have occurred. Two follow-up mailings to the first mailing of the posttest were completed to increase the response rates to the posttest. The first follow-up consisted of a reminder postcard; the second included a cover letter and a second copy of the posttest.

Data Analyses

Practice and perception items that had correct scores of 0 were reversed before generating mean total scores (Table 20). Practice scores of 0 were changed to 100; 99 to 1, ETC. Perception scores of 0 were changed to 5; 1 to 4; 2 to 3; 3 to 2; 4 to 1; and 5 to 0. Scores were not reversed before reporting mean individual item scores.

Statistical analysis was completed using SPSS version 6.1 for Windows (SPSS for Windows, 1995). The statistical analyses plan used to achieve each objective and answer corresponding research questions is described in Table 21. A p-value $\leq .05$ was used as the level of significance for all analyses.

Two items that assessed safe food handling practices were eliminated before statistical analyses were performed: check the temperature of the refrigerator and let infants drink from a bottle that has been out of the refrigerator for more than one hour. The scale of measurement, 0% to 100%, was not appropriate for the first item. For the second item, the words "of formula" should have been included after the words "a bottle." After these items were eliminated, there were 17 practice items for day care home providers and seven practice items for child care center teachers.

One knowledge item measuring the length of time formula can be out of the refrigerator was also deleted before statistical analysis. It was determined that there was no correct response choice for this item. After this item was eliminated, there were 15 knowledge items for day care home providers; eight for child care center teachers.

Qualitative data to determine the acceptability of the booklet were analyzed using methods described by Patton (1987). The responses to each open-ended item

measuring acceptability were reviewed. After reviewing the responses, categories for summarizing the data were determined by this researcher. The basis of construction of these categories was recurring regularities in the responses. Only a few responses were assigned to a category titled "miscellaneous" because there were insufficient responses to form a new category.

Table 20. Practice and perception items in which scores of 0 were reversed.

	Item number on pretest	Item number on posttest
Family/group day care home providers		
Safe food handling perceptions		
Perceived susceptibility to foodborne illness	7, 8	6, 7
Health locus of control	3, 4	2, 3
Safe food handling practices	3, 19	3, 19
Child care center teachers		
Safe food handling perceptions		
Perceived susceptibility to foodborne illness	7, 8	6, 7
Health locus of control	3, 4	2, 3
Safe food handling practices	3, 8	3, 8

Table 21. Inferential statistical analyses plan to answer study objectives and their corresponding research questions.

Objective	Research question	Statistical analysis	Variables
1	1	Two-tailed paired samples t-tests	Pretest and posttest scores for perceived seriousness of foodborne illness
		Two way analysis of variance	Posttest scores for perceived seriousness of foodborne illness
	2	Two-tailed paired samples t-tests	Pretest and posttest scores for perceived susceptibility to foodborne illness
		Two way analysis of variance	Posttest scores for perceived susceptibility to foodborne illness
	3	Two-tailed paired samples t-tests	Pretest and posttest scores for health locus of control
		Two way analysis of variance	Posttest scores for health locus of control

Table 21 (continued). Inferential statistical analyses plan to answer study objectives and their corresponding research questions.

Objective	Research question	Statistical analysis	Variables
2	4	Bivariate correlations	Pretest scores for safe food handling knowledge, perceptions and practices and posttest scores for perceived seriousness of foodborne illness, perceived susceptibility to foodborne illness and health locus of control
		Stepwise multiple regression	Factors with a statistically significant relationship based on the correlation coefficients above were entered as the independent variables for the following dependent variables -- posttest scores for perceived seriousness of foodborne illness, posttest scores for perceived susceptibility to foodborne illness and posttest scores for health locus of control
	5	Bivariate correlations	Pretest scores for knowledge items and pretest scores for practice items

CHAPTER IV

RESULTS AND DISCUSSION

This chapter focuses on results from the data collected during phase three: the evaluation of the model and the booklet. Both are described in detail in **CHAPTER III, METHOD**. The response rates to both the pretest and the posttest and a description of the subjects are reported initially. The remaining results are presented and discussed according to the constructs measured in this study -- safe food handling knowledge, practices and perceptions (perceived seriousness of foodborne illness, perceived susceptible to foodborne illness, motivations to handle food safely, perceived liability for causing foodborne illness, perceived benefits of handling food safely and health locus of control). Information about the acceptability of the booklet is presented last.

Subjects

According to Babbie (1991) the total response rate was low for all groups within both samples -- family/group day care home providers and child care center teachers. Babbie recommends a response rate of 50% or higher for reliable research results. However, Alreck and Settle (1995) state that mailed surveys with response rates over 30% are rare, therefore, generalizability of the data depends primarily on the

number of respondents to the survey and not the response rate. A discussion of both of these factors as they relate to this study follows.

The number of respondents. The number of respondents for each sample (the total number of respondents in the four groups defined by the Solomon-Four Group Research Design) was 293 day care home providers and 367 child care center teachers. This number includes respondents who completed the pretest but not the posttest. Krijcie and Morgan (1970) recommend 351 respondents to generalize the study results to the population of 3,992 licensed child care centers in Michigan; 375 providers were needed to generalize results to the population of 15,018 licensed family/group day care home providers in Michigan. The number of respondents was adequate for child care centers but not for day care home providers. Therefore, the results related to day care home providers are not generalizable to the population of 15,018 day care home providers in Michigan.

Response rate: Pretest. The response rate after the first mailing of the pretest was 29% for the experimental group and 30% for the control group within the day care home providers sample. For child care center teachers, the response rates were 37% and 27% for the experimental and control groups, respectively.

The follow-up mailing, a reminder postcard sent to all nonrespondents, increased the response rate to the pretest by 5% and 3%, respectively, for the experimental and control groups within the day care home providers sample and 3% and 2% for these same groups within the child care center teachers sample (Table 22). Sending a reminder postcard to nonrespondents is recommended by Babbie (1991) and Alreck and Settle (1995) as a method to increase the response rate by as much as

10%. In this study, it did not do so.

Response rate: Posttest. The response rates to the first mailing of the posttest are reported in Table 23 for the pretested experimental and control groups for both samples -- day care home providers and child care center teachers. Table 24 shows the response rates for the nonpretested experimental and control groups for both samples. In **CHAPTER III, METHODS**, a detailed description of the four groups is given. The response rates to the first mailing of the posttest was low for all groups within both samples, perhaps because the mailing was completed during the last week of November 1994 -- the beginning of the holiday season.

The first follow-up mailing for the posttest, a reminder postcard sent to all non-respondents, did not increase the response rate by more than 5% for any of the groups within either sample. The second follow-up mailing, a cover letter and a second copy of the posttest, increased the response rate by more than 10% for all groups within each sample. The increase in response rate was the most dramatic (32%) for the nonpretested control group within the child care center teacher sample.

When reviewing the response rates to the posttest, it appears that sending a reminder postcard was not an effective method to increase the response rate. Furthermore, three day care home providers wrote letters after having received the second follow-up mailing stating not to contact them again for this study. Therefore, one follow-up mailing, consisting of a cover letter and a second copy of the survey, would probably have sufficiently increased the response rates and would have been less intrusive to the respondent and less costly and time consuming.

Table 22. Pretest response rates for both samples.

Group	First mailing of pretest surveys					Follow-up mailing			Total response rate
	Surveys sent	Surveys returned undeliverable	Adjusted sample size	Surveys completed	Response rate	Surveys sent	Surveys completed	Response rate	
Family group day care home providers									
1[a]	600	70	530	155	29%	375	26	5%	34%(177)
2[b]	100	9	91	27	30%	64	3	3%	33% (30)
Child care center teachers									
1	600	39	561	220	37%	341	15	3%	40% (235)
2	100	4	96	26	27%	70	2	2%	29% (28)

[a] Experimental group
[b] Control group

Table 23. Posttest response rate for the pretested experimental and control groups within both samples.

Group	First mailing of posttest surveys			Follow up mailing 1[a]			Follow-up mailing 2[b]			Total response rate[c]
	Surveys sent	Surveys completed	Response rate	Cards sent	Surveys returned	Response rate	Surveys sent	Surveys returned	Response rate	
Family/group day care homes										
1[c]	177	80	44%	101	12	7%	89	30	17%	62%(112)
2[d]	30	14	47%	16	4	13%	8	3	10%	70%(21)
Child care center teachers										
1	235	94	40%	141	16	7%	125	22	9%	56%(132)
2	28	16	57%	12	1	4%	11	2	7%	71%(20)

[a] Reminder postcard
[b] A letter and a second copy of the posttest
[c] Pretested experimental group
[d] Pretested control group

Table 24. Posttest response rate for both samples.

	First mailing posttest surveys					First follow-up[a]			Second follow-up[b]			Total Response Rate
	Surveys sent	Surveys returned undeliverable	Adjusted sample size	Surveys completed	Response rate	Cards sent	Surveys completed	Response rate	Surveys sent	Surveys completed	Response rate	
Family/group day care home providers												
3[c]	200	28	172	29	16%	143	8	5%	135	17	10%	31%(53)
4[d]	100	8	92	14	9%	78	3	3%	75	18	21%	33%(35)
Child care center teachers												
3	200	30	170	3	15%	167	6	3%	161	19	10%	28%(55)
4	100	15	85	1	15%	84	2	2%	82	32	32%	49%(49)

[a] Reminder postcard
[b] A cover letter and a second copy of the posttest
[c] Nonpretested experimental group
[d] Nonpretested control group

Demographic data about the subjects

Characteristics of day care home providers and child care center teachers are given in Table 25. Day care home providers reported having their home licensed as a day care for 7.26 $\pm$ 5.24 years. Child care center teachers reported working as a child care provider for 8.19 $\pm$ 6.30 years. More day care homes (71%) cared for infants than did child care centers (22%).

The most common meals served by day care home providers were lunch (93%) and afternoon snack (93%). While, for centers, the primary meals served were afternoon snack (82%) and morning snack (68%). Overall, day care home providers more frequently served a wider range of meals than did centers. This finding could be attributed to the number of half-day programs and before and after school programs included in the child care center sample. In many of these programs a cold snack and not a hot meal is served.

Child care center teachers do not need to be evaluated about all aspects of safe food handling knowledge and practices because their center might only provide cold snacks. Furthermore, within the center, child care teachers are responsible for fewer foodservice tasks (Table 8) than are day care home providers (Table 9). Their food handling responsibilities are primarily related to serving foods and cleaning up tables after meals. Given these findings and the findings from the needs assessment, this researcher's decision to include fewer safe food knowledge items (homes = 14; centers = 8) for child care center teachers and safe food handling practices (homes = 17; centers = 7) was justifiable.

Some day care home providers (33%) served home-canned foods. Day care

home providers are allowed to serve home canned foods; child care centers cannot so this item was not included on the survey for child care center teachers.

Licensing regulations for family/group day care homes currently are being revised. The new regulations will not allow home canned foods to be served (personal communication with Joel Gorch and Jacqueline Wood, 1995). However, until the revisions are completed and enforced, information about safe canning methods for home canned foods is still needed by day care home providers.

Day care home providers were more likely to use an automatic dishwasher to clean and sanitize dishes (58%) than were centers (22%). In centers, three-compartment sinks were used more often for cleaning and sanitizing (42%).

Table 25. Characteristics of the pretested experimental group for both samples.

Demographic item	Day care home providers	Child care center teachers
	n = 177	n = 235
Years licensed	7.26 ± 5.24 yrs	8.19 ± 6.30 yrs
Provide care for infants	127 (71%)	52 (22%)
Meals served to children		
Breakfast	156 (88%)	106 (45%)
Morning snack	117 (66%)	158 (68%)
Lunch	166 (93%)	121 (52%)
Afternoon snack	164 (93%)	193 (82%)
Dinner	53 (30%)	3 (1%)
Other	13 (7%)	6 (3%)
Serve home canned foods	58 (33%)	NA[a]
Use automatic dishwasher	102 (58%)	51 (22%)
Three-compartment sink	34 (19%)	99 (42%)

[a] NA = not measured on the pretest sent to child care centers

Knowledge about safe food handling

Mean scores for all safe food handling knowledge items (day care homes = 15 items; child care centers = 8 items) are shown in Table 26. Child care center teachers had a higher mean knowledge score (88 $\pm$ 15%) than did day care home providers (75 $\pm$ 15%).

The percentage of day care home providers and child care center teachers correctly answering each knowledge item are presented in Tables 27 and 28. None of the eight knowledge items was difficult (a mean score of less than 75%) for child care center teachers. Five of the 14 knowledge items were difficult for day care home providers.

Twenty-four percent (24%) of day care home providers knew that the maximum safe temperature of a refrigerator was 45°F. This appears to be a difficult item until the other response choices are evaluated. The other response choices were 40°F, which 37% responded was correct, and 38°F, which 37% responded was correct. The USDA recommends that the maximum safe temperature a refrigerator should be is 40°F or colder, whereas the Michigan Foodservice Sanitation Code states that the maximum safe temperature of a refrigerator is 45°F or colder. After summing these three response choices, 93% of day care home providers were shown to be able to identify a safe refrigerator temperature. They just were not able to identify the maximum safe temperature stated in the Michigan Foodservice Sanitation Code. Twelve percent (12%) responded that 55°F was the maximum safe temperature of a refrigerator. These results suggest that most day care home providers know the range of safe refrigeration temperatures.

Four other knowledge items were difficult for day care home providers. These items included: indicators of safe leftovers (40% answered correctly); safe cooling methods (39% answered correctly); reserving foods (71% answered correctly); and indicators of unsafe food (56% answered correctly). A study by Albrecht et al. (1993) showed that 24% of 261 child care providers knew to cool hot food in a shallow pan. This compares to 39% (n = 74) of day care home providers in this study who knew to cool hot food in a shallow pan.

After reviewing these findings, it appears that child care center teachers are knowledgeable about safe food handling topics that are consistent with their food handling responsibilities. On the other hand, day care home providers still need information about several aspects of safe food handling. Specifically, day care home providers need information about safe handling of leftovers, what types of foods can be re-served, and indicators of unsafe food.

Table 26. Mean total knowledge scores for pretested experimental and control groups within both samples.

Sample	n	Mean[a]	SD[b]
Family/group day care home providers			
Pretested experimental group	177	75	15
Child care center teachers			
Pretested experimental group	235	88	15

[a] Scale of measurement was 0 to 100%.
[b] Standard deviation of the mean

Table 27. Family/group day care home providers -- pretested experimental group[a]: Percent of respondents answering each knowledge item correctly.

Knowledge item	Mean[b]	SD[c]
Diapering	69	46
Feeding baby food from jar	33	47
Safe leftovers	40	49
Safe cooling methods	39	49
Cooking	86	35
Sanitizing	82	39
Handwashing	94	25
Items to sanitize	92	27
Storing packaged food	88	32
Re-serving foods	71	45
Washing fruits/vegetables	92	27
Indicators of unsafe food	74	44
Removing mold	91	28
Identify unsafe food	55	50
Refrigerator temperature	24	55

[a] n = 177
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean

Table 28. Child care center teachers -- pretested experimental group[a]: Percent of respondents answering each knowledge item correctly.

Knowledge item	Mean[b]	SD[c]
Diapering	100	0
Feeding baby food from jar	90	30
Handwashing	98	13
Items to sanitize	87	12
Storing packaged food	94	24
Re-serving foods	97	17
Washing fruits/vegetables	91	29
Indicators of unsafe food	83	38

[a] n = 235
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean

Safe food handling practices

Pretest practice scores. The mean total pretest practice score (17 items) for day care home providers was 84 ± 10%. Center teachers had a mean total score (7 items) of 82 ± 12% (Table 29). Practices were self-reported by respondents within both samples.

Mean scores for each practice item were analyzed to determine specifically which recommended practices were not being applied. For day care home providers, scores were low for four of the 17 items (Table 30); one was low for child care center teachers (Table 31). Practice scores low for day care home providers were: checking food temperatures after initial cooking (38% ± 45%); checking food temperatures after reheating (50% ± 47%); sanitizing with bleach solution (42% ± 45%). For these practices the optimum score was 100%. Day care home providers were also tasting food 54% ± 43% of the time; child care center teachers reported tasting food 36% ± 42% of the time to determine if it was safe to eat. The wide standard deviations for all scores indicate that scores were spread across the entire range of 0 to 100%.

Posttest practice mean scores -- total and item -- were collected but not calculated or used for statistical analyses because: (1) change in practices occurs over time (Flay et al., 1980) and (2) there was no control over when the respondent completed the assessment. In the cover letter sent to both samples, the respondent was asked to complete the posttest after reading the booklet. This researcher has no information about how soon after reading the booklet did the respondent complete the posttest. Therefore, responses to posttest practice items might have provided information about <u>intentions</u> to change practices, but not <u>actual</u> change in practices.

Table 29. Mean total pretest practice scores[a] for both samples.

Sample	n	Mean[b]	SD[c]
Family/group day care home providers			
Pretested experimental group	177	84	10
Child care center providers			
Pretested experimental group	235	82	12

[a] 17 items on pretest sent to day care homes; seven items on pretest sent to child care centers
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean

Table 30. Family/group day care home providers -- pretested experimental group[a]: Mean pretest practice item scores.

Practice item	Mean[b]	SD[c]
Wash hands after diapering	97	12
Feeding baby from jar[d]	17	34
Check food temperature after cooking	38	45
Refrigerate leftovers in shallow pan	80	30
Check food temperature after reheating	50	47
Refrigerate leftovers after meal	93	21
Safe thawing	88	22
Sanitize with bleach solution	42	46
Wash hands before handling food	98	9
Clean and sanitize eating tables	88	28
Throw out uneaten food	95	20
Storing packaged food	99	6
Throw out unsafe foods	96	13
Wash raw fruits and vegetables	99	6
Sanitizing cutting board	78	39
Have children wash hands	93	20
Taste food to determine if safe[d]	54	43

[a] n = 177
[b] Scale is 0 to 100%
[c] Standard deviation of the mean
[d] Desired frequency of application is 0%.

Table 31. Child care center teachers -- pretested experimental group[a]: Mean pretest practice item scores.

Practice item	Mean[b]	SD[c]
Wash hands before and after diapering	99	4
Feed baby from jar[d]	17	32
Wash hands before handling food	99	4
Clean and sanitize eating table	96	13
Throw out uneaten food	94	18
Have children wash their hands	96	13
Taste food to determine if safe[d]	36	42

[a] n = 235
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean
[d] Desired frequency of application is 0%.

Safe food handling perceptions

Six perceptions were measured in this study -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, perceived benefits of handling food safely, motivations to handle food safely, perceived liability for causing foodborne illness and health locus of control. The response scale used to measure all perceptions was 0 (no agreement) to 5 (complete agreement) -- respondents could select any number between 0 and 5. This scale was selected because it is numerical, rather than ordinal, so inferential statistical analyses could be conducted.

Pretest scores. The mean pretest scores for the six perceptions measured in this study are shown in Table 32. Mean scores were high (>4 on a 5-point scale) for four of the six (motivations to handle food safely, perceived benefits of handling food safely, perceived seriousness of foodborne illness and perceived liability for causing foodborne illness) in both samples. A score of 5 was desired for all perceptions because it indicated that the respondent perceived this to be true. The mean scores for perceived susceptibility to foodborne illness and health locus of control were lower than the other perceptions but were still greater than 3 for both samples.

Table 32. Mean pretest scores for six perceptions from the pretested experimental group within both samples.

Factor	Mean[a]	SD[b]
Family/group day care home providers[c]		
Perceived susceptibility to foodborne illness	3.42	0.95
Perceived seriousness of foodborne illness	4.66	0.74
Health locus of control	3.54	0.79
Perceived liability for causing foodborne illness	4.07	1.01
Perceived benefits of handling food safely	4.57	0.54
Motivations for handling food safely	4.94	0.23
Child care center providers[d]		
Perceived susceptibility to foodborne illness	3.52	0.98
Perceived seriousness of foodborne illness	4.71	0.73
Health locus of control	3.46	0.89
Perceived liability for causing foodborne illness	4.22	1.02
Perceived benefits of handling food safely	4.51	0.67
Motivations to handle food safely	4.88	0.40

[a] Five point scale where 0 equals no agreement and 5 equals total agreement
[b] Standard deviation of the mean.
[c] n = 177
[d] n = 235

Three of the six perceptions measured on the pretest -- perceived seriousness of foodborne illness, perceived susceptibility to foodborne illness and health locus of control -- were selected to determine the effect of the booklet. The research questions related to the effect of the booklet will be answered below:

RESEARCH QUESTION 1: Does reading the booklet significantly change the perceived seriousness of foodborne illness?

RESEARCH QUESTION 2: Does reading the booklet significantly change the perceived susceptibility to foodborne illness?

RESEARCH QUESTION 3: Does reading the booklet significantly change health locus of control?

The mean pretest and posttest scores for the three safe food handling perceptions -- perceived seriousness of foodborne illness, perceived susceptibility to foodborne illness and health locus of control -- for the pretested experimental group within both samples are shown in Table 33. Two-tailed paired sample t-tests were used to determine if the differences between mean pretest and posttest scores were significant ($p \leq .05$).

Posttest scores for perceived susceptibility to foodborne illness changed significantly for day care home providers sample ($t = 3.72$; $p = .000$) and for child care center teachers ($t = 6.02$; $p = .000$). For both samples the mean posttest score moved in the desired direction toward total agreement. No significant difference was shown between mean pretest and posttest scores for perceived seriousness of foodborne illness or for health locus of control for either day care home providers or child care center teachers.

To determine if the change in posttest score for perceived susceptibility to

foodborne illness was due to pretesting and/or reading the booklet, mean posttest scores from the four groups (pretested experimental, pretested control, nonpretested experimental, and nonpretested control) within each sample were compared (Table 34). Results from a two-way analysis of variance showed that reading the booklet had a significant effect on mean posttest scores for perceived susceptibility [day care home providers ($F = 4.91$; $p = .028$) and child care center teachers ($F = 6.23$; $p = .013$)]; pretesting did not [homes ($F = .82$; $p = .366$) and centers ($F = 1.92$; $p = .166$)].

Mean posttest scores for perceived seriousness of foodborne illness and health locus of control were also compared across the four groups within both samples to determine if pretesting and/or reading the booklet had an effect on their mean posttest scores. Pretesting had an effect on mean posttest scores for health locus of control ($F = 4.086$; $p = .044$) from day care home providers; the intervention did not ($F = 0.187$; $p = .666$). Pretesting and reading the booklet had no effect on health locus of control posttest scores for child care center teachers. Pretesting and reading the booklet had no effect on posttest scores for perceived seriousness of foodborne illness for either sample.

This author attributes the change in posttest scores for perceived susceptibility to foodborne illness to the fact that throughout the booklet, **What You Can't See Can Hurt Your Kids and You!**, there were many messages about one's susceptibility to foodborne illness if food was not handled safely. These messages were included during development of the booklet so as to increase the reader's awareness of his or her susceptibility to foodborne illness. No change in posttest scores for perceived seriousness of foodborne illness and health locus of control could be attributed to

fewer messages appearing in the booklet that are related to these perceptions.

These results parallel other evaluations of health education print materials which have shown print materials to be effective at changing perceptions (Atwood et al., 1991; Hawkes, 1991; Hughes et al., 1993; Lieu et al., 1991). A study by Schafer et al. (1993) showed that perceived susceptibility to illness due to eating contaminated food was associated with food safety behaviors. Therefore, after reviewing the results of the studies cited above and the results related to change in perceived susceptibility to foodborne illness in this study, it could be concluded that the booklet could be used successfully to teach safe food handling to Michigan child care providers.

Table 33. Differences in mean pretest and posttest scores[a] for three perceptions for the pretested experimental group within each sample.

Variable	Pretest Mean	SD[b]	Posttest Mean	SD	t value[c]	p value
Family/group day care home providers[d]						
Perceived seriousness of foodborne illness	5.2	4.8	4.7	0.7	-.91	.370
Perceived susceptibility to foodborne illness	3.4	1.0	3.8	0.9	3.72	.000[e]
Health locus of control	3.6	0.8	3.7	0.9	1.63	.106
Child care center teachers[f]						
Perceived seriousness of foodborne illness	4.7	0.6	4.7	0.7	0.30	.764
Perceived susceptibility to foodborne illness	3.4	0.8	3.9	0.8	6.02	.000[e]
Health locus of control	3.5	0.9	3.6	0.9	1.74	.084

[a] Five point scale where 0 equals no agreement and 5 equals total agreement
[b] Standard deviation
[c] Two-tailed paired samples t-test
[d] n = 112
[e] Level of significance is a p-value $\leq$ .05.
[f] n = 132

Table 34. Results from a two-way analysis of variance to test for the effect of pretesting and the intervention on posttest scores for the safe food handling perception -- perceived susceptibility to foodborne illness.

Source of variation	SS[a]	DF[b]	MS[c]	F	Significance of F
Family/group day care home providers[d]					
Within+Residual	199.59	220			
Intervention	4.45	1	4.45	4.91	.028[e]
Pretesting	0.74	1	.74	.82	.366
Intervention by Pretesting	0.48	1	.48	.53	.467
Child care center teachers[f]					
Within+Residual	186.92	270			
Intervention	4.31	1	4.31	6.23	.013[e]
Pretesting	1.34	1	1.34	1.93	.166
Intervention by Pretesting	.04	1	.04	.06	.805

[a] Sum of squares
[b] Degrees of freedom
[c] Mean sum of squares
[d] n = 221
[e] Level of significance is a p-value of $\leq .05$.
[f] n = 256

The relationship between safe food handling knowledge, practices and perceptions

Stepwise multiple regression analyses were used to answer **RESEARCH QUESTION 4: What is the relationship between years of experience, safe food handling knowledge, practices and perceptions?**

Correlational analysis. For each sample, bivariate correlations were computed to determine the strength and significance of the relationships between the posttest scores for the three perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control -- and the pretest scores for years of child care experience, safe food handling knowledge, perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, perceived benefits of handling food safely, motivations to handle food safely, perceived liability for causing foodborne illness and health locus of control -- and practices. Correlation coefficients are presented in Table 35 for day care home providers and in Table 36 for child care center teachers. Pretest factors that showed a significant (p-value $\leq .05$) relationship with the posttest factor(s) are marked with an asterisk.

Stepwise multiple regression analyses were completed for three dependent variables -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control -- to determine <u>what</u> influenced change (posttest scores) in each. Factors measured on the pretest -- knowledge about safe food handling, safe food handling practices, perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness, health locus of control, perceived consequence of not handling food safely, perceived benefits of handling food safely

and perceived liability for causing foodborne illness -- that showed a significant relationship ($p \leq .05$) with the dependent variable were entered as an independent variable in the regression analysis (Tables 35 and 36).

Results are reported related to the percent of variance (R^2) accounted for by independent variables that showed a significant relationship to the dependent variable (Tables 37 and 38). Changes in perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control were each explained by different factors. These factors are discussed below.

Perceived susceptibility to foodborne illness. For day care home providers pretest scores for perceived benefits of handling food safely accounted for 6% of the variance in change in perceived susceptibility to foodborne illness by day care home providers; 94% is unexplained. For child care center teachers, 7% of the variance was accounted for by pretest scores for susceptibility to foodborne illness (Table 38). No other predictive variables entered into the multiple regression analyses accounted for a significant amount of the variance in change in perceived susceptibility to foodborne illness. This leaves 94% and 93% of the variance unexplained.

Perceived seriousness of foodborne illness. For day care home providers knowledge about safe food handling and pretest scores for perceived seriousness to foodborne illness accounted for 15% and 21% of the variance for change in perceived seriousness of foodborne illness. These two factors explained 36% of the variance in posttest scores for perceived seriousness of foodborne illness. Perceived benefits of handling food safely and perceived susceptibility to foodborne illness accounted for 5% and 9% of the variance in the posttest scores from child care center teachers. No

other factors accounted for a significant amount of the variance in change of perceived seriousness of foodborne illness within either sample. Again, similar to change in perceived susceptibility to foodborne illness, a large amount of the variance is unexplained.

Health locus of control. The number of years a home was licensed as a day care provider and pretest scores for perceived liability for causing foodborne illness accounted for 13% and 9%, respectively, of the variance in change in health locus of control by day care home providers. For child care center teachers, 12% of the variance in change in health locus of control scores was explained by the pretest score for health locus of control.

A large amount of the variance is not explained for the changes in all three perceptions in both samples. A study of adult Texans by McIntosh (1994) showed tht the best predictors of awareness of food hazards were demographic characteristics, such as gender and levels of education and income. In this same study other perceptions about food hazards were not good predictors. In other studies demographic characteristics were also shown to be good predictors of perceptions about food safety situations (Huang, 1992; Jussaum and Judson, 1992).

Interestingly, safe food handling practices did not explain change in any of the three safe food handling perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control. This leads the author to believe that change in perceptions probably occurs before change in practices.

Table 35. Child care center teachers: Correlations between safe food handling knowledge, practices and perceptions.

Posttest factor	Pretest factor: Years	Knowledge about safe food handling	Perceived benefits of handling food safely	Perceived liability for causing food-borne illness	Perceived susceptibility to foodborne illness	Perceived seriousness of foodborne illness	Health locus of control	Perceived motivations to handle food safely	Safe food handling practices
Perceived susceptibility to foodborne illness	.0661	.1271	.0860	.0669	-	.1059	.1969*	.0474	-.1007
Perceived seriousness of foodborne illness	.0875	.0146	.2022*	.3179*	.1059	-	.0324	.4546*	.0326
Health locus of control	.0529	-.0300	.2819*	.3413*	.1969*	.0324	-	.1460*	-.0823

* Significant at a p-value $\leq .05$

Table 36. Family/group day care home providers: Correlations between safe food handling knowledge, practices and perceptions.

Posttest factor	Pretest factor: Years	Knowledge about safe food handling	Perceived benefits of handling food safely	Perceived liability for causing food-borne illness	Perceived susceptibility to foodborne illness	Perceived seriousness of foodborne illness	Health locus of control	Perceived motivations to handle food safely	Safe handling practices
Perceived susceptibility to foodborne illness	.0656	.1838*	.2094*	.0656	-	.2971*	.1537*	-.0032	-.0751
Perceived seriousness of foodborne illness	.0219	.0143	.1789*	.3834*	.2971*	-	.1310	.0266	.0404
Health locus of control	.0242	.1218	.2995*	.2554*	.1537*	.1310	-	.2349*	-.0449

* Significant at a p-value ≤ .05

Table 37. Family/group day care home providers: Multiple regression analysis to explain variance in posttest scores for three dependent variables.

Dependent variable[a]	Independent variable[b]	Multiple R	R^2	F-value	Significance of F	Beta
Perceived susceptibiility to foodborne illness	Perceived benefits of handling food safely	.26	.07	7.49	.0073	.39
Perceived seriousness of foodborne illness	Knowledge about safe food handling	.39	.15	18.31	.0000	.018
Health locus of control	Motivations to handle food safely	.30	.09	10.17	.0019	.86
	Years home licensed for day care	.36	.13	7.57	.0009	-.03

[a] The mean posttest scores for these perceptions were entered as the dependent variable.
[b] The mean pretest scores for these factors were entered as the independent variables.

Table 38. Child care center teachers: Multiple regression analysis to explain variance in posttest scores for three dependent variables.

Dependent variable[a]	Independent variable[b]	Multiple R	R^2	F-value	Significance of F	Beta
Perceived susceptibility to foodborne illness	Perceived susceptibility to foodborne illness	.26	.07	9.44	.0026	.26
Perceived seriousness of foodborne illness	Perceived susceptibility to foodborne illness	.22	.05	6.32	.0131	.220
	Perceived benefits of handling food safely	.30	.09	6.42	.0022	.178
Health locus of control	Health locus of control	.35	.12	17.62	.0000	.35

[a] The mean posttest scores for these perceptions were entered as the dependent variable.
[b] The mean pretest scores for these factors were entered as the independent variables.

Assessment of the effect of knowledge on safe food handling practices

This section will answer **RESEARCH QUESTION 5: Is knowledge about specific safe food handling topics related to safe food handling practices?** Ten knowledge items were each matched with 10 practice items from the pretest sent to day care home providers; six pairs were matched from the pretest sent to child care center teachers. The match was based on the knowledge and practice items measuring the same construct. Bivariate correlations were used to determine the strength and the significance of the association between each pair.

Family/group day care home providers. Three of the knowledge and practice pairs had a significant relationship, as indicated by a p-value $\leq .05$ (Table 39). However, none of the relationships was strong ($\geq .70$ or $\geq -.70$) (Fitz-Gibbon and Morris, 1987). Only one of the pairs, feeding child from a jar of baby food, showed a moderate positive correlation (-.57). The other two pairs -- cooling leftovers in shallow pans and indicators of unsafe foods -- showed weak correlations (.31 and -.24, respectively). These results indicate that a large amount of the variance in practices is still unexplained by knowledge. Therefore, recommendations related to these findings are made with caution.

In this study Table 30 shows that the mean pretest practice scores for feeding a child from a jar ($17 \pm 34\%$) and tasting food to determine if it was safe ($54 \pm 43\%$) were not acceptable. The results of this correlation analysis suggest that these practices could be improved by providing information about these unsafe practices. The booklet **What You Can't See Can Hurt Your Kids and You!** addresses both of these topics. Therefore, day care home providers who read the booklet might be less

likely to apply these unsafe practices.

Child care center teachers. Three of the six knowledge and practice pairs had a significant relationship but none were strong relationships (Table 40). Pairs assessing the constructs "feeding a child from a jar" and "tasting food to determine if it is safe" each showed a negative correlation. The pair measuring the construct "re-serving food" showed a positive correlation.

In this study child care center teachers reported feeding children from a jar 17% $\pm$ 32% of the time and tasting food to determine if it was safe 36% $\pm$ 42% of the time (Table 31). Both are unsafe practices and could lead to foodborne illness. The correlation results indicate that providing information about these two topics has the potential to reduce the frequency of these unsafe practices.

When reviewing the literature, most assessing the relationship between knowledge and practices indicates there is no relationship between knowledge and practices. Perhaps in studies that report the lack of a relationship (Sims, 1980; Schwartz, 1975) the reason was that mean total knowledge scores and mean total practices scores were correlated. Comparing total scores rather than item scores might dilute the relationship between knowledge about specific concepts and their corresponding practices.

Table 39. Family/group day care home providers -- pretested experimental group[a]: Correlations between knowledge items and practices.

	Knowledge		Practice		Correlation	p-value
	Mean[b]	SD[c]	Mean	SD	coefficient[d]	
Handwashing before diapering	94	25	97	13	-.02	.817
Feed child from jar	87	34	21	35	-.57	.000[e]
Cooling leftovers in shallow pans	39	49	77	34	.31	.001[e]
Sanitizing method	61	49	46	45	-.01	.897
Handwashing before handling food	94	25	98	12	-.05	.521
Have children wash hands	94	25	94	19	-.09	.267
Storing packaged food	88	32	99	9	.10	.184
Re-serving food	71	46	99	9	-.05	.524

Table 39 (continued). Family/group day care home providers -- pretested experimental group: Correlations between knowledge items and practices.

	Knowledge		Practice		Correlation coefficient[a]	p-value
	Mean	SD	Mean	SD		
Washing fruits and vegetables	92	26	98	9	.01	.883
Indicators of unsafe food	74	44	58	43	-.24	.008[e]

[a] n = 177
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean
[d] Pearson's product-moment correlation coefficient
[e] Significance is a p-value $\geq$ .05.

Table 40. Child care center teachers -- pretested experimental group[a]: Correlations between knowledge items and practices.

	Knowledge		Practice		Correlation	p-value
	Mean[b]	SD[c]	Mean	SD	coefficient[d]	
Handwashing before diapering	98	13	99	3	-.03	.822
Feed child from jar	91	30	17	32	-.35	.030[e]
Handwashing before handling food	98	13	98	8	.01	.893
Re-serving food	93	26	95	18	.41	.000[e]
Have children wash hands	98	13	96	16	-.03	.609
Indicators of unsafe food	13	38	32	41	-.21	.003[e]

[a] n = 235
[b] Scale of measurement was 0 to 100%.
[c] Standard deviation of the mean
[d] Pearson's product-moment correlation coefficient.
[e] Significance is a p-value $\leq$ .05.

Acceptability of the booklet

RESEARCH QUESTION 6: Is the booklet acceptable to child care providers?

Frequencies were generated for all acceptability items written in an ordinal response format (Appendix L). Qualitative data gathered using open-ended questions were summarized using the methods of Patton (1987).

More (80%) day care home providers read the entire booklet than did child care center teachers (60%). The percent frequency of specific topics not read by day care home providers and child care center teachers are listed in Table 41. Only 19% of day care home providers and 19% of center teachers reported that they did not learn anything new after reading the booklet. When asked what they learned, the greatest number of day care home providers and child care center teachers stated that they learned new information about: foodborne illness, temperatures and sanitizing and cleaning. This was interesting since day care home providers were only checking food temperatures after cooking 38% of the time, checking food temperatures after reheating 50% of the time, and sanitizing with bleach solution 42% of the time (Table 30). Perhaps these practices were not applied was because the provider did not know they needed to apply them.

When asked which topics were not useful, both child care center teachers and day care home providers reported that field trips and caring for infants and toddlers were not useful. The most common reason stated was that they (the child care center or the day care home) did not provide this service. In centers, 22 teachers responded the fact sheet about cooking was not useful to them because their center only provided

Table 41. Topics that were read by day care home providers and child care center teachers within the pretested experimental group and the nonpretested experimental group.

Topic	Number (%)[a]	
	Day care home providers	Child care center teachers
Regulations	111 (96)	130 (96)
Foodborne Illness	116 (100)	135 (96)
Unsafe Food	116 (100)	134 (99)
Storing Food	113 (97)	134 (99)
Cooking	113 (97)	126 (93)
Cleaning Up	114 (98)	136 (100)
Snack and Meal Time	113 (97)	135 (96)
Field Trips	109 (94)	124 (91)
Caring for Infants and Toddlers	111 (96)	102 (75)

[a] Percents were calculated as the number of who selected the response divided by the total number within the sample.

cold snacks to the children.

No one from either sample stated the booklet was not easy to read. Most of the comments regarding the presentation of the booklet were: it was easy to read, the layout was professional and the information was useful. The negative comments focused on the repetition of the information explaining sanitizing. This section was repeated throughout the booklet because the booklet was designed to be a series of fact sheets. The fact sheets could be used separately or as a book, therefore, this information needed to be repeated. One respondent stated the booklet was not appropriate for 2.5 hour programs, such as Head Start, because it included information not pertinent to their setting. This finding further justifies the use of fact sheets. The appropriate fact sheets can be used as a training tool within a center depending on the services provided by the child care program. Overall, these results indicate that the booklet was acceptable to providers in both day care homes and centers.

Strengths and limitation of this study

Validity of the evaluation instrument. A strong point of this study was that appropriate steps were taken to insure that the evaluation instrument was valid and appropriate for use with Michigan child care providers. Content validity, the degree to which test items represent a specific construct (Shaw and Wright, 1967), was verified continuously during the development stages by a panel of experts with expertise in the areas of food safety, evaluation and education. Three focus groups of child care providers were used to determine the appropriateness of the language and format of the evaluation instrument.

Reliability of the safe food handling knowledge items. Two pilot tests were performed to assess the K-R 20 coefficient, a determinant of internal consistency of a series of items, for the knowledge items. The K-R 20 coefficients from the first pilot test (n=28) and second pilot test (n=41) were 0.2997 and -0.0997, respectively. Guidelines recommend a K-R 20 coefficient of $\geq$0.70 (Fitz-Gibbson and Morris, 1987). These values suggest a lack of internal consistency. In **CHAPTER III, METHOD** a discussion of the K-R coefficient is presented. The interpretation focuses on what makes an acceptable K-R 20 coefficient -- a series of items that are not difficult and that have similar levels of difficulty. This author believed that it was necessary to include diffult knowledge items (difficulty determined by difficulty indexes of less than 0.75) so as to more accurately represent safe food handling knowledge for Michigan child care providers.

Writing multiple choice items that have only one correct answer under all circumstances was very difficult. A better assessment of safe food handling knowledge might have been to present a scenario of a food handling situation and provide a series of questions about the situation. This approach would have assessed the respondent's ability to apply safe food handling knowledge rather than just identify safe food handling facts.

Demographic information. Most demographic information collected in this study was about the child care setting rather than about the individual respondent. The only demographic information collected about the individual was the number of years child care center teachers had worked as a child care provider. Not including demographic items was a limitation because some studies show that there is a direct

relationship between demographic factors and perceptions, particularly health locus of control. Assessing demographics, such as age of the respondent and level of education, might have increased the amount of explainable variance within the posttest scores for perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control.

Threats to internal validity. Use of the Solomon Four-Group Design increased the strength of the experimental design by determining the effect of external factors (Campbell and Stanley, 1963). By including the nonpretested experimental and control groups, the effects of pretesting, the effect of reading the booklet and their interaction were determinable. This design also tested for the respondent's sensitivity or responsiveness to the perceptions -- perceived susceptibility to foodborne illness, perceived seriousness of foodborne illness and health locus of control. The Solomon Four-Group Design also controlled for all threats to internal validity.

The assessment of perceptions uses indirect measurement. Since it is not possible to measure perceptions directly, assessment of them is based on self-reported responses using item statements as a stimulus. These self-reports vary depending on the honesty of the respondent and their ability to understand the statement and to categorize their perceptions into fixed response choices. There is an assumption that it is valid to accept a person's responses about their own perceptions as accurate indicators of the perception. Another limitation to this study and all studies including measures of perceptions is that the respondent might record a response that they believe is socially acceptable but is not representative of their true perceptions or their true practices.

Response set might also have been a limitation related to the assessment of perceptions. Response set is when the respondent does not read the item statements but simply indicates their responses by marking a single response category for all items. This type of response set was minimized in this study by wording items positively and negatively.

The limitations stated above in relation to the assessment of perceptions also apply to the practices assessed in this study. Practices were self-reported and, therefore, respondents might have recorded applying practices at a frequency that they believed was socially acceptable rather than what they were actually doing. Just as with perceptions, there is an assumption that it is valid to accept a person's responses about their own practices as accurate indicators of the practice.

Threats to external validity. External validity, the extent to which results can be generalized to, or across, persons, settings, or times, can be maximized by random selection of subjects from the population to which the investigator plans to generalize. In this study, data were collected from a random sample of Michigan day care home providers and child care centers. Although it would have been desirable to generalize results of this study to child care providers across the U.S., results can only be generalized to Michigan child care providers because subjects were not randomly selected from all states.

The measurement setting was not highly standardized and posed a threat to the internal validity of the study. The surveys -- pretest and posttest -- were mailed and self-administered by the respondent. Many factors could have affected the providers' responses including: interruptions from children, neighbors, or phone, fluctuations in

environmental conditions or noise level; time of day; day of the week; and events that occurred in the home on the day the survey was being completed.

Self-administered, mailed surveys often result in a low response rate (Alreck and Settle, 1995). Others who have tried to reach child care providers by mailing self-administered surveys have also indicated response rates of about 30% (personal communication with Anne Murphy, 1995, and Jacqueline Wood, 1995). For this study, a direct mail survey was used in order to have greater control over sample selection and follow-up mailings to nonresponders.

The generalizability of these data depended on the number of respondents and the response rate rather than just the response rate. The sample size is sufficient for center teachers but low for day care home providers. The low response rate across all groups within both samples could produce a nonresponse bias. An evaluation of differences between responders and nonresponders was not performed because the only demographic information available about nonresponders was their address. As a result, some types of providers are overrepresented and others underrepresented. Ordinarily those who are highly involved with the topic are more likely to respond that those who are not. That includes those who have extreme positive and extreme negative feelings about safe food handling. The more neutral the respondents or the less experience they have with the topics or issues, the more likely they will discard the questionnaire.

The timing of the mailings might also have affected the response rate and the number of respondents. The surveys were mailed primarily during November and December -- a holiday season.

Limitations of the booklet. The booklet was a print material. Many studies

have shown that print materials are effective at changing knowledge and perceptions but not changing practices (Hawkes, 1994; Hughes et al., 1993; Lieu et al, 1994). Therefore, to be optimally effective the booklet should be used in conjunction with a larger outreach program that incorporates teaching methods that are effective at changing practices.

CHAPTER V

CONCLUSIONS

Based on the findings of this study, this author has several recommendations regarding safe food handling information for Michigan child care providers and the effect and acceptability of the booklet, **What You Can't See Can Hurt Your Kids and You!**. These recommendations will be discussed in this chapter.

Safe food handling educational needs

This study overwhelmingly shows that the educational needs for the two groups -- day care home providers and child care center teachers -- are different after reviewing the findings related to safe food handling knowledge and practices. Therefore, most of the recommendations will be made specific to day care home providers and to child care center teachers rather than to child care providers as a whole.

More day care homes (71%) reported caring for infants than did child care centers (22%). Therefore, information about safely preparing and serving food to infants is needed by day care home providers. It is also essential to provide child care centers that are licensed to care for infants information about safe food handling as it relates to caring for infants and toddlers. Many of the child care center teachers in

this study stated they did not find the fact sheet -- caring for infants and toddlers -- to be useful because their center did not provide this type of service.

Information about safe sanitizing methods is needed by both groups. Over 23% of day care homes and 36% of child care centers did not report using either sanitizing methods -- an automatic dishwasher or a three-compartment sink. Why proper sanitizing prevents foodborne illness is needed by both groups. But, when focusing on how to sanitize, day care home providers need information about using an automatic dishwasher, whereas, child care centers need information about using a three-compartment sink.

Child care center teachers were knowledgeable about aspects of safe food handling that were assessed. This indicates information about safe food handling might not be needed by this group. However, if information is provided, it should focus on safely serving snacks rather than preparing full meals since the most common meals served in child care centers are morning and afternoon snacks.

Day care home providers do need information about all aspects of safe food handling, especially safe handling of leftovers. Only 39% of day care home providers knew how to safely cool leftovers. Considering that unsafe cooling practices contributes to over 40% of reported cases of foodborne illness, this information is important. Knowledge about safe cooling methods and cooling leftovers in shallow pans were associated indicating that providing this information has the potential to increase the frequency that leftovers are cooled in shallow pans. Other topics that day care home providers were not knowledgeable about were: identifying a safe refrigerator temperature (as related to the Michigan Foodservice Sanitation Code),

reserving foods to children and identifying unsafe foods.

Total mean pretest safe handling practice scores were better for day care home providers (84% ± 10%) than for child care center teachers (81 ± 12%). However, when individual practices for day care home providers were analyzed, four practices needed improvement. These practices were: checking food temperatures after cooking, checking food temperatures after reheating, sanitizing dishes and utensils with a bleach solution, and tasting food to determine if it was safe to eat. For child care center teachers, only one practice needed improvement -- tasting food to determine if it was safe to eat.

All of these findings support the recommendation that safe food handling information be specific to either the day care home or child care center setting. The booklet, **What You Can't See Can Hurt Your Kids and You!**, would meet this need since it is formatted as a series of fact sheets. The fact sheet format allows the reader to only read the sections that are appropriate to his/her child care situation.

The effect of the booklet

For both day care home providers and child care center teachers, perceived susceptibility to foodborne illness changed significantly after reading the booklet. The validity of this finding was confirmed by a two-way analysis of variance. Pretesting was shown to <u>not</u> have an effect on posttest scores of perceived susceptibility to foodborne illness, but reading the booklet did. This was a very interesting finding since perceived susceptibility to illness due to eating contaminated food has been shown to affect food safety practices (Schafer et al., 1993).

Different factors explained the change in perceived susceptibility to foodborne illness within the two groups. Pretest scores for perceived benefits of handling food safely explained change in perceived susceptibility to foodborne illness for day care home providers and pretest scores for perceived susceptibility to foodborne illness explained the change in child care center teachers. However, a large amount of the variance was still unexplained indicating other factors need to be measured before conclusions can be made about change in perceived susceptibility to foodborne illness. Reading the booklet had no effect on changing perceptions about the seriousness of foodborne illness or health locus of control.

Acceptability of the booklet

Comments about the booklet were very positive indicating that the booklet was acceptable to both day care home providers and child care center teachers. The only negative comments related to the booklet were that the sanitizing section was repeated too much. This author believed it was necessary to repeat the sanitizing section since each fact sheet needed to stand alone.

The topics that both groups learned the most about were foodborne illness, food temperatures and sanitizing. Interestingly, day care home providers were not checking food temperatures and sanitizing with a bleach solution before reading the booklet. Since changes in practices were not evaluated, it was not known if these practices improved after reading the booklet.

Topics reported to <u>not</u> be useful were field trips and caring for infants and toddlers. The main reason cited by respondents for these two topics not being useful

was that the child care facility in which they worked did not provide this service. Twenty-two teachers also indicated that since their center did not provide hot meals, the section on cooking was not appropriate.

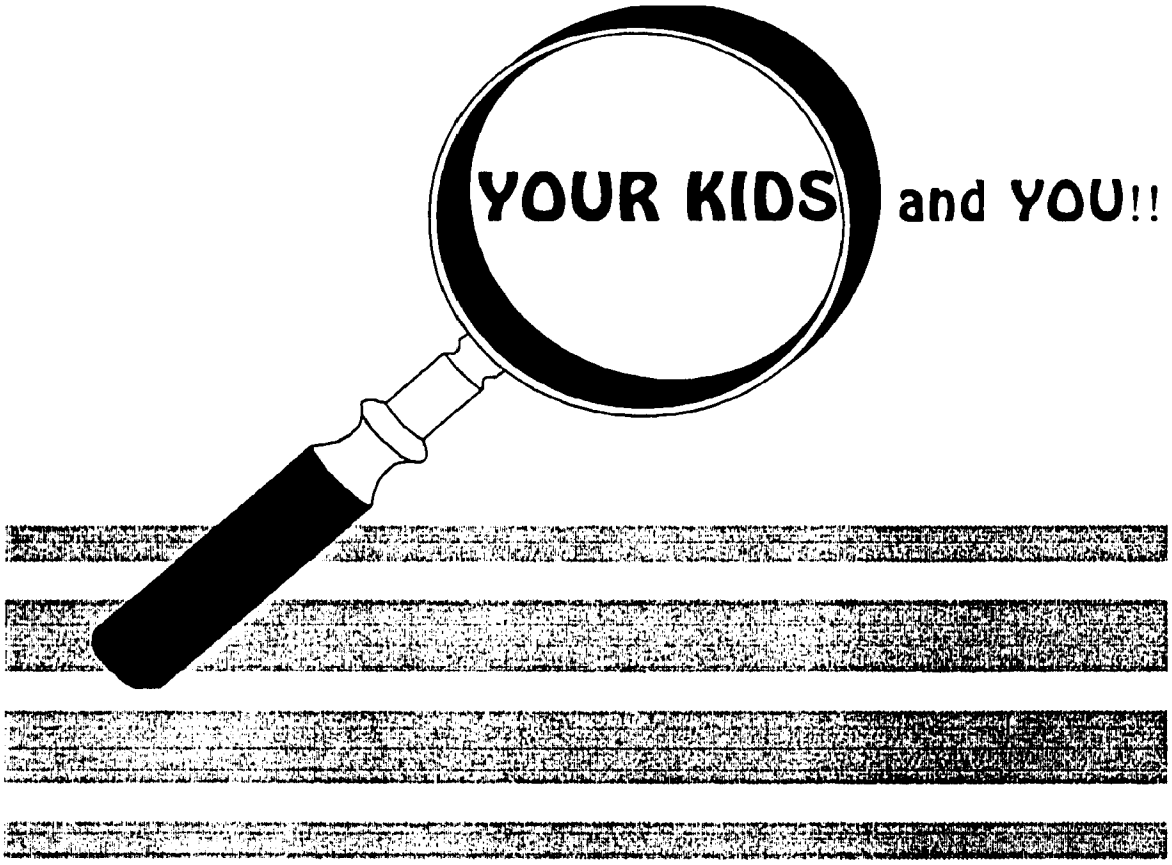
In summary it is recommended that the booklet, **What You Can't See Can Hurt Your Kids and You!**, be incorporated into an educational program to teach safe food handling to Michigan child care providers. The booklet addressees safe food handling knowledge and practices that could be improved by day care home providers and child care center teachers. The booklet also is effective at changing perceived susceptibility to foodborne illness, which has been shown to influence food safety behaviors. Finally, the booklet is acceptable to child care providers and, therefore, most importantly is likely to be read and referred to.

APPENDICES

APPENDIX A

Safe food handling booklet, What You Can't See Can Hurt Your Kids and You!

WHAT YOU CAN'T SEE, CAN HURT



Preventing foodborne illness in your child care center or day care home

Contents

About this booklet

This booklet explains how to prevent foodborne illness in a child care facility. Each page describes a food handling topic important in the child care setting.

We hope you find this information useful in helping you reduce the risk for foodborne illness in your child care center or family/group day care home.

Regulations

for child care centers or day care homes

Where to get a copy of the licensing rules

There are two sets of licensing rules: one for child care centers and one for family/group day care homes. Food handling requirements are included in each set of rules. The rules contain information on child care requirements other than food handling.

If you would like a copy of either set of rules, contact your regional Department of Social Services licensing consultant *or* write:

Division of Child Day Care Licensing
Department of Social Services
P.O. Box 30037
Lansing, MI 48909
(517) 373-8300

Include your name, address, and the title of the licensing rules with your request. If you work in a child care center request Licensing Rules for Child Care Centers. If you work in a family/group day care home, request Licensing Rules for Family and Group Day Care Homes.

Licensing rules for both child care centers and family/group day care homes are continuously updated. Food handling requirements might change.

Where to find food handling requirements in the licensing rules

Child care centers. Food handling requirements are described under the topics of **food**, **foodservice sanitation**, **milk**, **formula**, and **diapering**.

The section about foodservice sanitation refers to Act No. 368 of the Public Acts of 1978. This act is known as Michigan's Foodservice Sanitation Regulations. For more information about these regulations (which are more in-depth about food handling than are the child care licensing rules), contact:

Shelter and Environment Section
Division of Environmental Health
Department of Public Health
P.O. Box 30195
Lansing, MI 48909
(517) 335-8293

Family/group day care homes. Food handling requirements can be found under the topic, **food**, in the licensing rules.

Information presented in this booklet is consistent with the food handling requirements described in both sets of licensing rules.

Foodborne Illness

Each day millions of children eat food prepared and served in child care facilities. The food must be safely handled to reduce the risk for foodborne illness.

What is foodborne illness?

Foodborne illness is caused by eating food containing harmful bacteria (or their toxins), viruses, or parasites. These organisms are everywhere: in food; in soil and water; and on humans, animals, and birds.

Potential victims

Annually, between 24 to 81 million people in the U.S. get foodborne illness. Most cases are not life-threatening. However, each year more than 9,000 people die from foodborne illness. Serious complications are more common in high risk populations including young children, pregnant women, the elderly, and those chronically ill.

Prevention

- Wash your hands often.
- Keep hot food hot and cold food cold.
- Clean and sanitize food surfaces.

Common symptoms

Symptoms of foodborne illness usually begin 6-24 hours after eating contaminated food. Sometimes foodborne illness is confused with the flu because the symptoms are similar:

- **cramps**
- **nausea**
- **diarrhea**
- **vomiting**

Healthy adults usually recover from foodborne illness in a few days, but high risk populations, such as young children, are more likely to develop serious complications that could lead to death.

What are toxins?

Some bacteria form toxins. Eating food which contains toxins can cause foodborne illness. You cannot tell by looking, smelling, or tasting food if toxins have formed in it.

You can prevent toxins from forming by handling food safely from the time you buy it until the time you serve it. Thorough cooking does <u>not</u> destroy toxins that have formed because of unsafe food handling.

Unsafe food = Foodborne illness

Unsafe Food

All food used in your center or day care home must be from an approved source, such as a:

- ***grocery store***
- ***food wholesaler***

It can be dangerous to serve:

- ***home canned food****
- ***unpasteurized dairy foods****
- ***wild game****

* **These foods cannot be served in child care centers. Please see the licensing rules for more information.**

Foods from unapproved sources have not passed state or federal inspections and might not be safe to eat.

Special exceptions

Fresh fruits and vegetables from a garden or a farmer's market can be served <u>if</u> rinsed thoroughly with water before use.

Do <u>not</u> use soap or detergent when washing fruits and vegetables. Soap and detergents can leave a residue which might not be safe to eat.

What is spoiled food?

Spoiled food is food in which bacteria grow or natural chemical reactions occur. Spoilage cannot be prevented; it can only be slowed by proper storage.

You can sometimes detect spoiled food by looking at it or smelling it. Color changes and bad smells are good indicators of spoilage.

Throw out spoiled food because it can cause foodborne illness.

What is contaminated food?

Contaminated food is food that contains harmful bacteria, viruses, or parasites. Contaminated food might also contain dirt and insects. You cannot detect contaminated food because it usually does <u>not</u> smell, look, or taste bad.

Prevent contamination by handling food safely from the time you buy it until the time you serve it.

If you think a food is contaminated, do not taste it! Throw it out! It is unsafe to eat. It is better to waste this food than to risk foodborne illness.

Contaminated food = Unsafe food

Unsafe Food

Cans and jars checklist

Before opening cans and jars, check for:

- leaks;
- bulges, including bulging lids;
- severe dents;
- cracks; and
- loose lids.

If you detect any of these, **throw out the can or jar**. It could contain harmful bacteria.

Throw out cans or jars that are rusty or very dirty. Food is either old or was stored in an unsafe place.

After opening cans and jars of food, **throw it out** if you detect:

- spurting liquid;
- bubbles; and
- bad smells.

Gas or acid has formed which means harmful bacteria might be in the food.

Pets and food preparation

Do not allow cats or other pets to walk on countertops and food preparation or eating surfaces. Caged animals, such as turtles, gerbils, and hamsters, should always be kept away from food preparation and serving areas.

Always wash your hands and children's hands after playing with pets. Pets might have bacteria, viruses, and parasites on their bodies.

Moldy food

Some molds produce toxins which cause food-borne illness. If you see mold on cheeses, such as:

- cheddar;
- mozzarella; and
- colby

cut away a one inch section surrounding the mold and throw the section out.

If you see mold on meat, poultry or in cottage cheese, jelly, jam, or other semi-solid food, throw the whole food out. You cannot completely remove the mold from these types of food; it could cause illness.

If a slice of bread is moldy, throw out the entire loaf. The mold roots (which cannot be seen) might have spread to other slices.

Unsafe food for pets

Never feed contaminated or spoiled food to pets; it could make them sick. Throw out contaminated or spoiled food in a covered trash can so that kids and animals cannot get it.

Storing Food

Food might be safe when you buy it, but improper storage can make it unsafe to eat.

Proper storage can slow food spoilage. But more importantly, proper storage can prevent food contamination. Contaminated food is unsafe to eat.

Store unopened, nonperishable food

- in a cool, dry area;
- on cleanable shelving that is at least six inches off the floor or in kitchen cupboards; and
- in a tightly covered container if removed from its original packaging. Label the container, not the lid, with the name of the food. Lids can be interchangeable and might be put onto the wrong food.

Never store food under any plumbing lines (especially kitchen sinks). If the lines drip, food can become contaminated.

Never store food on the floor. Dirt, insects or water that might be on the floor can contaminate the food.

Proper refrigeration

Refrigerator temperatures should be no higher than 45°F. It is even better to keep refrigeration temperatures at 40°F or colder. Store

- meats, fish, poultry;
- eggs;
- dairy products; and
- food containing meat, fish poultry, eggs, or dairy products

in the coldest part of the refrigerator. The coldest part is usually toward the back of the refrigerator.

Wrap raw meat, poultry, and fish with plastic wrap or aluminum foil. before refrigerating. Store them on the lowest shelf of the refrigerator so their juices do not drip onto other food and contaminate them.

Bacteria and viruses might be on the surface of fresh fruits and vegetables. During cutting, bacteria and viruses on the surface could contaminate the edible part of the fruit or vegetable. To prevent contamination wash fruits and vegetables thoroughly before handling and store in the refrigerator after cutting. For the best quality do not store bananas in the refrigerator.

Proper storage = Safe food

Storing Food

Freezer storage

Keep freezer temperatures at 0°F or colder. Freezer temperatures slow bacterial growth but do not kill bacteria. Use a refrigerator thermometer to check freezer temperatures.

Thawing food

- Put food into the refrigerator the day before needed. (You will need more than one day to thaw a large piece of meat or poultry.)

or

- Microwave food immediately before cooking.

or

- Cook thoroughly.

Never refreeze food that has been thawed. During thawing bacteria can grow. Refreezing the food does not kill the bacteria.

Check food children bring from home

If food or lunches need to be kept cold, refrigerate immediately. If not, store in a clean area that is not on the floor.

Milk

- Do not store milk in a container other than the original container.

At the dairy plant milk is dispensed into sterilized cartons or jugs. You could contaminate the milk if you transfer it to another storage container.

How cold is your refrigerator?

Check refrigerator temperatures by putting a thermometer inside the refrigerator near the door. (You can buy a refrigerator thermometer at some grocery stores, discount stores, and most restaurant suppliers). **The refrigerator should be at 45°F or colder to slow bacterial growth. If your refrigerator is 40°F or colder, that is even better for safe food storage.** If your refrigerator is higher than 45°F, adjust the setting to make it colder.

Covering food

Protect food from mold and dust by:

- leaving it in the original packaging **or**
- putting it into another container and then covering the container with a lid, plastic wrap, or aluminum foil.

Cooking

Thorough cooking of meat, poultry, fish and eggs decreases the risk for foodborne illness...

One of your best defenses against foodborne illness is thorough cooking of food. Thorough cooking kills harmful bacteria, viruses, and parasites that cause foodborne illness. (Cooking does not destroy toxins.) Improper cooking allows harmful bacteria, viruses, and parasites to survive and grow in food.

Before you cook . . .

- Wash your hands with soap and water.

Hands can contain harmful bacteria, viruses, and parasites that contaminate food and cause illness. These microorganisms are too small to see, so even hands that look clean need to be washed with soap and water for at least 20 seconds.

- Cut food on a clean and sanitized surface with a knife that is clean and sanitized.

- Clean and sanitize pots, pans, and utensils before use.

Cooking temperatures

Thoroughly cook food to recommended **internal** temperatures to kill bacteria, viruses, and parasites.

	Required	Recommended
Fish and beef	140°F	140°F
Ground beef	140°F	155°F
Pork	150°F	160°F
Poultry/eggs	165°F	180°F
Leftovers	165°F	165°F

Set oven temperatures to 325°F or hotter to cook meats, fish, and poultry.

Microwave cooking

Food cooked in a microwave oven might have "cold spots." These cold spots can support the growth of harmful bacteria. Cook beef and fish to an internal temperature of 145°F, pork to 170°F, and poultry to 180°F when using a microwave oven. Also, stir foods frequently to evenly distribute heat.

Reheat leftovers containing:

meat	**fish**
poultry	**beans**
rice	**eggs**
dairy products	**potatoes**

to an **internal** temperature of 165°F or hotter to kill harmful bacteria.

Cooking

Eggs

Eggs must be thoroughly cooked until the white and yolk are firm (not runny). Never eat raw or partially cooked eggs because they might contain harmful bacteria.

Never let children taste batter or lick a spoon or bowl used to prepare a recipe that contains raw eggs. Foods that might contain raw or undercooked eggs include:

- cake batter;
- cookie dough;
- homemade egg nog;
- homemade mayonnaise;
- homemade ice cream;
- French toast; and
- quiche.

Frequently check food temperatures:

- immediately after cooking;
- before serving food; and
- immediately after reheating.

Clean and sanitize the "stem" of the thermometer before each use. This can be done with sanitizing solution (see page 10).

Cooking must be continuous. Never partially cook food, let it sit, then finish cooking it later. This provides conditions that allow harmful bacteria to grow and possibly toxins to be formed. Toxins are not destroyed by cooking, so reheating the food later will not make it safe to eat.

If food is cooked ahead of time, cook it completely then cool it rapidly (within four hours).

- Put cooked food into shallow pans that are about two inches deep.
- Refrigerate immediately.
- Cover the pans with a lid, plastic wrap, or aluminum foil after one hour.
- Label the side of the pan with the date the food was cooked.
- Use within two days after cooking.

Rapid reheating can kill bacteria (but not toxins)

- Reheat leftovers to an internal temperature of 165°F or hotter.
- Never reheat food in crock pots or slow cookers. They take too long to heat food to safe temperatures.

Throw out leftovers that are more than two days old. They can be unsafe to eat. It is better to waste this food than to risk foodborne illness.

Buying a food thermometer

You can buy a food thermometer from most restaurant suppliers. The thermometer's temperature range should be **0°F-220°F**. Meat thermometers have a range of **130°F-190°F**.

Cleaning Up

Proper cleaning and sanitizing can reduce the risk for foodborne illness.

What is cleaning?

Cleaning is the removal of dirt, food, and grease from a surface with soap or detergent and water.

What is sanitizing?

Sanitizing is the killing of harmful bacteria and viruses that can be on a surface (even if they look clean). Sanitizing can only be done with sanitizing solution.

What to sanitize

Before and after preparing food, always clean and sanitize:

- countertops;
- sinks;
- high chair trays;
- drying racks;
- tables used for eating;
- plastic-coated placemats; and
- plastic-coated bibs.

Bacteria and viruses on these surfaces can contaminate food. Proper sanitizing will kill the bacteria and viruses.

Sanitizing with Bleach

Household bleach is an approved sanitizer. It is inexpensive, effective, and available at your local grocery store. Do not use scented bleaches, such as fresh scent or lemon scent, for sanitizing. For other approved sanitizers, contact your local health department.

Sanitizing solution for surfaces*

- Mix one tablespoon of bleach with one gallon of warm (not hot) water.
- Store mixture in a labelled spray bottle. It can be used for up to one week.

Sanitizing surfaces*

1. Clean surface with warm soapy water.
2. Rinse with clean water.
3. Spray surface with sanitizing solution.
4. Spread the sprayed solution over the surface with a clean paper towel.
5. Air dry. Do not rinse off the sanitizing solution.

* Do not use this method to sanitize dishes, utensils, cutting boards, or pots and pans. See page 11 for instructions on how to sanitize these items.

Cleaning Up

Immersion sanitizing is for:

- dishes and glassware;
- cutting boards;
- utensils; and
- pots and pans.

Immersion sanitizing in child care centers

A three-compartment sink should be used for washing, rinsing, and sanitizing.

- Wash dishes with warm soapy water in compartment one.
- Rinse dishes with clear water in compartment two to remove all soap or detergent.
- Soak in sanitizing solution in compartment three for at least one minute.
- Air dry in a drying rack. Do not rinse off sanitizing solution.
- Store clean and sanitized dishes and cooking equipment in a clean area. Never store these items on the floor.

You can also use a dishmachine for immersion sanitizing.

Preparation of sanitizing solution for immersion sanitizing

- Determine how many gallons of water your sink can hold.
- Fill sink with warm water.
- Add one tablespoon of bleach for every gallon of water your sink holds.

Immersion sanitizing in day care homes

Many day care homes do not have a three-compartment sink. Put a plastic dishpan on the drainboard next to your sink to immitate a three-compartment sink. Use this set-up by:

- Washing items in warm soapy water in compartment one.
- Rinsing items in compartment two with clear water to remove all soap or detergent.
- Soaking items in the dishpan filled with sanitizing solution for at least one minute. Items must be completely immersed in sanitizing solution.
- Air drying in a drying rack. Do not rinse off sanitizing solution.
- Storing clean and sanitized items in a clean area. Never store items on the floor.

Snack and Meal Time

Prevent contamination of food before, during, and after snack and meal time.

BEFORE: Snack and meal time

- Wash your hands (and children's hands) with soap and water immediately before serving food or eating.
- Use utensils, **not** your hands, to serve food.
- Clean and sanitize counters and tabletops before serving food.

Hands can contain harmful bacteria, viruses, and parasites that contaminate food and cause illness. They are too small to see, so even hands that look clean need to be washed with soap and water.

- Keep food at safe temperatures before serving (45°F or colder and 145°F or hotter).
- Do not put food on the table before children are ready to eat.

After cooking, keep food hot (145°F or hotter) by continuing to heat at a low temperature. Do not turn the burner off and **"let it sit"** until needed.

Leave cold food covered and in the refrigerator until just before serving.

DURING: Snack and meal time

- Do not let children share the same spoon or dish when eating.
- Do not let children serve themselves from large boxes of cookies, cereal, or crackers.

Children's saliva can contain harmful bacteria which can be transferred to other children. If children serve themselves, harmful bacteria and viruses on their hands can contaminate food in the box.

- Provide a clean and sanitized utensil for each serving bowl and serving dish.

Harmful bacteria and viruses that might be on utensils, tabletops, or counters contaminate food. Clean and sanitize utensils, tables, and counters after every use to prevent contamination.

- Do not let children eat food that has fallen on the floor.
- Do not use utensils that have fallen on the floor until they have been cleaned and sanitized.

Dirt and insects on the floor can contaminate food.

Snack and Meal Time

AFTER: Snack and meal time

Throw out uneaten food that has been served but not eaten. Never put milk that has been poured into glasses or cups back into the original container -- throw it out! When food has been on the table, it might have been contaminated by fingers, utensils, or sneezes! The only foods that can be saved and served later are:

- unpeeled fruits; and
- unopened nonperishable packaged food.

Food prepared but not served can be stored in the refrigerator and used within two days. Food containing meat, fish, poultry, eggs, and dairy products must be rapidly cooled to prevent bacterial growth. Freeze food immediately after cooking for longer storage.

Rapid cooling can prevent bacterial growth

Refrigerate leftovers quickly to minimize bacterial growth.

- Put cooked food into shallow pans that are two inches deep or less.
- Refrigerate immediately.
- Cover pans with a lid, plastic wrap, or aluminum foil about one hour after refrigerating.
- Label the side of the pan with the date the food was cooked.

Throw out leftovers that are more than two days old. They can be unsafe to eat. It is better to waste this food than risk foodborne illness.

Sanitize these surfaces before and after snacks and meals:

- kitchen counters;
- tables used for eating;
- plastic-coated bibs
- plastic-coated mats;
- high chair trays; and
- drying racks.

*Sanitizing solution for surfaces**

- Mix one tablespoon of bleach with one gallon of warm (not hot) water.
- Store mixture in a labelled spray bottle. It can be used for up to one week.

*Sanitizing surfaces**:

1. Clean surface with warm soapy water.
2. Rinse with clear water.
3. Spray the surface with sanitizing solution.
4. Spread the solution over the surface with a clean paper towel.
5. Air dry. Do not rinse off sanitizing solution.

* Do not use this method to sanitize dishes, utensils, cutting boards, or pots and pans. See page 11 for instructions on how to sanitize these items.

Field Trips

Prevent bacterial growth by keeping hot food hot (140°F or hotter) and cold food cold (45°F or colder).

Bacteria grow when food is kept at unsafe temperatures. If food is kept at unsafe temperatures for even one hour, harmful bacteria grow.

Take foods that do not need to be kept hot or cold:

- peanut butter sandwiches;
- jelly sandwiches;
- cookies;
- crackers;
- fresh unpeeled fruit;
- commercially dried fruit; and
- unopened cans of fruit or pudding.

Always prepare food with:

- clean hands;
- in a clean work area; and
- on clean and sanitized surfaces.

Keep cold food cold

Some foods that must be kept cold include:

- meat sandwiches*;
- tuna or egg salad sandwiches*;
- milk, cheese, or yogurt*;
- opened cans of fruit; and
- peeled or cut fruits and vegetables.

Keep food cold by:

- putting chilled food into an insulated lunch bag with a frozen gel pack **or** with a frozen juice box.
- filling a cooler with ice; putting food in a leak-proof container; and putting the containers into the ice.

Chill cold food in the refrigerator overnight before the field trip. Also, freeze sandwiches overnight to keep them safe. They will most likely thaw by lunch but still stay cold enough to be safe. Lettuce and other greens do not freeze well. Pack these separately and add to sandwiches before eating.

* Child care centers are not allowed to take these foods on a field trip.

Safe temperatures = Safe food

Field Trips

Keep hot food hot

Use a thermos to keep hot food hot.

- Fill the thermos with very hot water.
- Let the thermos sit for about ten minutes.
- Remove water from the thermos and fill with hot food.

Soup, sloppy joe mix, and casserole mixtures can be kept safely hot this way. Do not keep hot food in a thermos for more than two hours.

Read the manufacturer's label when selecting a thermos.

Check food children bring from home

If food needs to be kept cold, be sure there is a way to do so. Pack lunches with:

- a frozen gel pack or
- a frozen juice box.

You can also freeze most sandwiches to keep them safe until lunch. Hot food must be stored in a thermos until eaten.

Wash hands before eating

If no water is available for handwashing before eating, pack handwashing wipes for each child. Do not let children share the same handwashing wipe. Harmful bacteria and viruses could be on the handwashing wipe

Packing tips:

- Pack food in a clean container that is washed and sanitized after every use.
- When using paper bags for food, be sure they are clean.

Sanitizing solution for surfaces*

- Mix one tablespoon of household bleach with one gallon of warm (not hot) water.
- Store mixture in a spray bottle. The mixture can be used for up to one week.

Sanitizing surfaces*

1. Clean surface with warm soapy water.
2. Rinse with clear water.
3. Spray the surface with sanitizing solution.
4. Spread solution over the surface with a clean paper towel.
5. Air dry. Do not rinse off sanitizing solution.

* Do not use this method to sanitize dishes, utensils, cutting boards, or pots and pans. See page 11 for instructions on how to sanitize these items.

Caring for Infants and Toddlers

Safe food handling is critical to preventing illness in infants and toddlers.

Infants and toddlers are at high risk for foodborne illness because of their immature immune systems. When an infant or toddler eats contaminated food, he or she is likely to get sicker than an adult and the illness is likely to be more severe.

Diapering

Bacteria, viruses, and parasites are present in the stool of sick **and** healthy people. Always wash your hands after changing diapers to prevent contaminating people and food. Never wash hands in the sink you use for food preparation.

Sanitize diapering tables after **each** changing to kill harmful bacteria and viruses. Although it might not be convenient, only change babies on designated diapering tables (never on tables or counters used for preparing or serving food) which are away from food preparation and service areas.

High chair trays

Clean and sanitize high chair trays before and after each use. The tray could be a source of bacteria and viruses that cause foodborne illness.

Baby food

- After opening, label can or jar with child's name and the date and time opened.
- Refrigerate unserved portions in the original can or jar.
- Throw out unused baby food within 36 hours after opening. Throwing food out one day after opening is even safer.
- Observe the "use-by" date for shelf storage of unopened jars of baby food.

Keep a permanent marker and masking tape in the kitchen to make labelling easy.

Serve baby food from a dish, not directly from a jar or can, to prevent contamination. Throw out the uneaten food served to the baby. The baby's saliva, transferred from the spoon to the food, can contain harmful bacteria.

Breast milk

- Ask parents to label each container of breast milk with: the name of the child, date, and time it was pumped.
- Refrigerate and use breast milk within **one day**.
- Freeze breast milk for up to 3-4 months for longer storage time.
- Remind parents to refrigerate breast milk in a sterilized bottle.

Caring for Infants and Toddlers

*Sterilizing baby bottles**

Sterilizing kills all bacteria, viruses, and parasites. Sanitizing does not kill all parasites. Child care centers may sterilize and reuse bottles under specific situations. See the Licensing Rules for a list of the situations.

- Take apart the bottle.
- Wash the bottle, nipple, and ring in warm soapy water.
- Rinse thoroughly with water.
- Cover the bottle, nipple, and ring with boiling water and continue boiling for five minutes.
- Remove from water with sanitized tongs and air dry on a clean and sanitized dry rack. Tongs should be sanitized using the method for immersion sanitizing described on page 11.
- When **completely** dry, cap bottle and store in a clean cupboard. Never cap bottles while still wet because water in the bottom of the bottle could support the growth of mold.
- Pacifiers and teething toys should also be sterilized daily.

Formula

Add formula only to sterilized bottles. Bottles that have not been sterilized might be contaminated.

Never add new formula to a half-filled bottle of formula. Bacteria and viruses in baby's saliva could be in the "old" formula and contaminate the "new" formula.

Refrigerate prepared bottles of formula and use within one day since some harmful bacteria grow at refrigerator temperatures.

Opened cans of formula

- Cover opened cans with a clean lid or plastic wrap.
- Label the can with the date the can was opened.
- Refrigerate and use within two days or by the manufacturer's stated use time, whichever comes first.
- Feeding time should last no longer than one hour.
- Throw out leftover formula found in the bottle after the feeding. Fill bottles with less formula or use a smaller bottle.
- For shelf storage of unopened cans of formula, observe "use-by" dates printed on the can.

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APPENDIX B

Advisory committee

APPENDIX B

Advisory Committee

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APPENDIX C

Operational definitions of measurement domains and factors listed in Figures 2 and 3.

APPENDIX C

Operational definitions of measurement domains and factors listed in Figures 2 and 3.

Operational definitions of measurement domains and factors represented in the model (Figures 2 and 3).

I. Measurement domains

A. **Cognitive** is the dimension that represents the process of knowing.

1. **Knowledge** is factual information (Flay et al., 1980).

B. **Affective** is the dimension that represents feelings, emotions, or emotional responses

1. **Motivation** is the inner drive or impulse that causes one to act in a certain way.

2. **Perception** is the individual's interpretation of reality. A perception is not necessarily based on truth.

C. **Behavior** is anything that an individual does that involves action and response to stimulation from the internal and/or external environment.

1. **Preventive health behavior (health action)** is any activity undertaken by an individual for the purpose of preventing disease or detecting disease in an asymptomatic stage (Kasl and Cobb, 1966).

2. **Practice** is the usual mode, method, or pattern of performance within a specific contextual situation.

Operational definitions of measurement domains and factors represented in the model (Figures 2 and 3).

II. Factors represented in the model

A. **Perceptions** (Affective domain)

1. **Perceived susceptibility to foodborne illness** is the individual's interpretation of the possibility of contracting foodborne illness.

2. **Perceived seriousness of foodborne illness** is the individual's interpretation of the harm foodborne illness will create for him/her.

3. **Perceived liability for causing foodborne illness** are the individual's interpretation of the legal and economic consequences of not handling food safely as related to the risk of foodborne illness.

4. **Perceived benefits associated with safe food handling** is an individual's interpretation of the benefits of safe food handling practices as related to economics, health.

5. **Perceived motivations for handling food safely** is an individual's interpretation of reasons to handle food safely.

6. **Health locus of control** is one's beliefs about the relationship between one's behavior and its outcomes. The potential for a behavior to occur in any specific psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement in that situation and the value of that reinforcement (Rotter, 1975).

   a. **Internal locus of control** is that the reinforcement is under the control of the individual (Rotter, 1975).

   b. **External locus of control** is that the reinforcement is under the control of outside forces such as fate, luck, chance, or powerful others (Rotter, 1975).

B. **Knowledge about safe food handling** (Cognitive domain) is the known principles about safe food handling as they relate to preventing foodborne illness.

C. **Demographics** are the vital statistics of a specific population.

APPENDIX D

Pretest instrument

APPENDIX D

Pretest instrument

I. Pretest sent to child care center teachers

Background information about yourself and your center.

---

1. How long have you worked as a child care provider? ____ years

2. What is your job title? _____

3. Does your center provide care for infants (ages 0-12 months)?

   ___ Yes ___ No

4. Which meals are served to the children in your center?

   ___ breakfast ___ lunch ___ dinner
   ___ morning snack ___ afternoon snack ___ other: _____

5. Does your center use an automatic dishwasher to wash dishes?

   ___ Yes ___ No ___ I don't know

6. Does your center use a three-compartment sink to wash dishes?

   ___ Yes ___ No ___ I don't know

KNOWLEDGE ABOUT FOOD SAFETY

Circle the response you believe is correct without using a reference or asking anyone.

If your center does not care for infants, go to question 4.

1. How should a diapering table be sanitized?

   a. Wiped with a cloth soaked in a solution of bleach and water.
   b. Sprayed with a solution of bleach and water and wiped thoroughly.
   c. Wiped with a cloth soaked in soapy water.
   d. I don't change diapers.

2. Formula left out of the refrigerator for more than _____ minutes will be unsafe.

   a. 30
   b. 15
   c. 60
   d. I don't feed babies formula.

3. To prevent harmful bacteria from contaminating baby food:

   a. feed infants or toddlers directly from the jar.
   b. never feed infants or toddlers directly from the jar
   c. put the food needed into a bowl or plate and then feed.
   d. I don't feed babies.

4. Which of the following statements is true about washing hands?

   a. Hands should be washed for 20 seconds with soap and water before handling food.
   b. Hands should be rinsed under hot water before handling food.
   c. Hands should be dipped in a sanitizing solution before handling food.
   d. Hands do not always need to be washed before handling food.

5. Which of the following items should be washed and sanitized before each use:

   a. Eating tables
   b. Cutting boards
   c. Utensils
   d. All of the above

6. Packaged food can be safely stored:

   a. on the floor if the floor is clean.
   b. beneath the kitchen sink.
   c. on shelving that is at least six inches off the floor.
   d. all of the above

7. When can uneaten food served to children be saved and served again?

   a. If nobody touched it.
   b. If it is cooled in shallow pans.
   c. If it is reheated thoroughly before serving.
   d. All food served to children must be thrown out.

8. Before serving raw fruits and vegetables:

   a. wash thoroughly with soap and water.
   b. rinse thoroughly with cold water.
   c. scrub with a vegetable brush and water.
   d. dip in a sanitizing solution.

9. The best way to determine if a food is unsafe is if:

   a. it tastes bad.
   b. it smells bad.
   c. it looks bad.
   d. you cannot tell if a food is unsafe to eat by doing a, b, and c.

OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (where 0 = no agreement and 5 = complete agreement) to describe how much you agree with the statement.

0 <------> 5

1. Foodborne illness is almost 100% preventable if you handle food safely. _____
2. Handling food safely is worth the time it takes. _____
3. Foodborne illness is usually caused by food that was contaminated when it was bought. _____
4. I cannot prevent children from getting foodborne illness while in my care. _____
5. It is my fault if children get sick from the food I serve to them. _____
6. Foodborne illness can be prevented if I handle food safely. _____
7. Generally, foodborne illness is rare. _____
8. People who are healthy rarely get foodborne illness. _____
9. Anyone can get foodborne illness if they eat unsafe food. _____
10. Healthy young children have a higher risk for foodborne illness than do healthy adults. _____
11. Parents might remove their child from my care if the child got sick from the food served. _____
12. I could be sued if a child got foodborne illness from food they eat while in my care. _____

13. The center might be closed down by health authorities if I do not follow food safety requirements. _____

14. Foodborne illness can cause death. _____

15. Foodborne illness can cause serious health problems. _____

16. Preventing foodborne illness in the child care center is a child care provider's responsibility. _____

17. Learning about food safety is very important for child care providers. _____

18. Child care providers must do what is needed to provide food that is safe to eat. _____

HANDLING FOOD SAFELY

Write any number from 0% to 100% (where 100% = all of the time and 0% = never) to indicate how often you:

0%<----->100%

If you do NOT care for infants, go to question 4.

1. Wash hands before and after diapering children. _____

2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____

3. Feed a baby directly from a jar of baby food. _____

4. Wash your hands before you handle food. _____

5. Clean and sanitize the eating table ***before*** children eat. _____

6. Throw out uneaten food that has been served to children. _____

7. Have children wash their hands before eating. _____

8. Taste food to determine if it is safe to eat. _____

II. Pretest sent to daycare home providers.

Background information about yourself.

---

1. How long has your home been a licensed daycare home? ____ years

2. Do you provide care for infants (ages 0-12 months)?

   ___ Yes ___ No

3. Which meals do you usually serve to children you care for in your home?

   ___ breakfast ___ lunch ___ dinner
   ___ morning snack ___ afternoon snack ___ other: _____

4. Do you ever serve home canned foods? ___ Yes ___ No

5. Do you use an automatic dishwasher to wash dishes?

   ___ Yes ___ No ___ I don't know

6. Do you use a three-compartment sink to wash dishes?

   ___ Yes ___ No ___ I don't know

KNOWLEDGE ABOUT FOOD SAFETY

Circle the response you believe is correct without using a reference or asking anyone.

If you do not care for infants, skip to question 4.

1. How should a diapering table be sanitized?

   a. Wiped with a cloth soaked in a solution of bleach and water.
   b. Sprayed with a solution of bleach and water and wiped.
   c. Wiped with a cloth soaked in soapy water.
   d. I don't change diapers.

2. Formula left out of the refrigerator for more than _____ minutes will be unsafe.

   a. 30
   b. 15
   c. 60
   d. I don't feed babies formula.

3. To prevent harmful bacteria from contaminating baby food:

   a. feed infants or toddlers directly from the jar.
   b. never feed infants or toddlers directly from the jar.
   c. put the food needed into a bowl or plate and then feed.
   d. I don't feed babies.

If you only serve cold meals, go to question 7.

4. Safely cooled leftovers that contain meat, fish, or poultry are safe to eat if:

   a. they have been reheated to at least 140°F.
   b. they have been reheated no more than one time.
   c. they are no more than four days old.
   d. Hands do not always need to be washed before handling food.

5. Leftovers that contain meat, fish, and poultry can be safely cooled

   a. in a pot no more than eight inches deep.
   b. in a container no more than two inches deep.
   c. in a container no more than four inches deep.
   d. I don't save leftovers.

6. Cooking food thoroughly will:

   a. make a contaminated food safe.
   b. kill bacteria in the food.
   c. destroy toxins that might have formed in the food.
   d. I don't cook food.

If you only use disposable cups, plates, and utensils, go to question 8.

7. The proper way to clean dishes and utensils is to:

   a. Wash, rinse, and sanitize.
   b. Rinse, wash, and sanitize.
   c. Sanitize, rinse, and wash.
   d. I don't know.

8. Which of the following statements about handwashing is true:

   a. Hands should be washed 20 seconds with soap and water before handling food.
   b. Hands should be rinsed under hot water before handling food.
   c. Hands should be dipped in a sanitizing solution before handling food.
   d. I don't know.

9. Which of the following items should be washed and sanitized before each use:

   a. Eating tables
   b. Cutting boards
   c. Utensils
   d. All of the above

10. Packaged food can be safely stored:

   a. on the floor if the floor is clean.
   b. beneath the kitchen sink.
   c. on shelving that is at least six inches off the floor.
   d. all of the above

11. When can uneaten food served to children be saved and served again?

   a. If nobody touched it.
   b. If it is cooled in shallow pans.
   c. If it is reheated thoroughly before serving.
   d. All food served to children must be thrown out.

12. Before serving raw fruits and vegetables:

    a. wash thoroughly with soap and water.
    b. rinse thoroughly with cold water.
    c. scrub with a vegetable brush and water.
    d. dip in a sanitizing solution.

13. The best way to determine if a food is unsafe is if:

    a. it tastes bad.
    b. it smells bad.
    c. it looks bad.
    d. you cannot tell if a food is unsafe to eat by doing a, b, and c.

14. On which of these foods can mold be safely removed?

    a. cheese
    b. bread
    c. cottage cheese
    d. jelly

15. Which of the following foods might be <u>unsafe</u> to eat?

    a. Ground beef thawed overnight in the refrigerator
    b. Food from a dented can
    c. A block of cheese with mold growth removed
    d. An unopened package of crackers that has been served to children

16. The warmest temperature a refrigerator can safely operate at is:

    a. 50°F.
    b. 45°F.
    c. 40°F.
    d. 38°F.

OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (where 0 = no agreement and 5 = complete agreement) to best describe how much you agree with the statement.

		0<----->5
1.	Foodborne illness is almost 100% preventable if you handle food safely.	_____
2.	Handling food safely is worth the time it takes.	_____
3.	Foodborne illness is usually caused by food that was contaminated when it was bought.	_____
4.	I cannot prevent children from getting foodborne illness while in my care.	_____
5.	It is my fault if children get sick from the food I serve to them.	_____
6.	Foodborne illness can be prevented if I handle food safely.	_____
7.	Generally, foodborne illness is rare.	_____
8.	People who are healthy rarely get foodborne illness.	_____
9.	Anyone can get foodborne illness if they eat unsafe food.	_____

		0<------>5
10.	Healthy young children have a higher risk for foodborne illness than do healthy adults.	_____
11.	Parents might remove their child from my care if the child got sick from the food served.	_____
12.	I could be sued if a child got foodborne illness from food they eat while in my care.	_____
13.	The center might be closed down by health authorities if I do not follow food safety requirements.	_____
14.	Foodborne illness can cause death.	_____
15.	Foodborne illness can cause serious health problems.	_____
16.	Preventing foodborne illness in the child care center is a child care provider's responsibility.	_____
17.	Learning about food safety is very important for child care providers.	_____
18.	Child care providers must do what is needed to provide food that is safe to eat.	_____

HANDLING FOOD SAFELY

Write any number from 0% to 100% (where 100% = all of the time and 0% = never) to indicate how often you:

0%<----->100%

If you do not care for infants, go to question 4.

1. Wash hands before and after diapering children. _____
2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____
3. Feed a baby directly from a jar of baby food. _____

If you only serve cold meals, go to question 9.

4. Check the temperature of meat, fish, poultry, or eggs immediately after cooking. _____
5. Refrigerate leftovers that contain meat, fish, poultry, or eggs in shallow containers. _____
6. Check the temperature of food immediately after reheating. _____
7. Refrigerate leftovers that contain meat, fish, poultry, or immediately after the meal. _____
8. Thaw frozen food in the refrigerator or microwave oven. _____

If you only use disposable cups, plates, and utensils, go to question 10.

9. Sanitize dishes and utensils with a bleach solution after every use. _____
10. Wash your hands before you handle food. _____
11. Check the temperature of the refrigerator. _____
12. Clean and sanitize the eating table ***before*** children eat. _____

13. Throw out uneaten food that has been served to the children. _____

14. Store packaged food in a clean place other than the floor. _____

15. Throw out cans, jars, and packaged foods with dents, bulges, or tears. _____

16. Wash raw fruits or vegetables before serving. _____

17. Sanitize cutting boards with a bleach solution. _____

18. Have children wash their hands before eating. _____

19. Taste food to determine if it is safe to eat. _____

Thank you for your time!

Please return the survey to:

Angela Fraser
Department of Food Science and
Human Nutrition
165 S. Anthony Hall
Michigan State University
East Lansing, MI 48824
(517) 355-7686

APPENDIX E

Posttest instrument

APPENDIX E

Posttest instrument

I. Posttest sent to the experimental groups within the child care center teachers sample

I. HANDLING FOOD SAFELY

Write any number from 0% to 100% (100% = all of the time and 0% = never) to indicate how often you:

0%<----->100%

If you do NOT care for infants, go to question 4.

1. Wash hands before and after diapering children. _____
2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____
3. Feed a baby directly from a jar of baby food. _____
4. Wash your hands before you handle food. _____
5. Clean and sanitize the eating table ***before*** children eat. _____
6. Throw out uneaten food that has been served to children. _____
7. Have children wash their hands before eating. _____
8. Taste food to determine if it is safe to eat. _____

II. OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (0 = no agreement and 5 = complete agreement) to describe how much you agree with the statement.

		0 <------> 5
1.	Foodborne illness is almost 100% preventable if you handle food safely.	_____
2.	Foodborne illness is usually caused by food that was contaminated when it was bought.	_____
3.	I cannot prevent children from getting foodborne illness while in my care.	_____
4.	It is my fault if children get sick from the food I serve to them.	_____
5.	Foodborne illness can be prevented if I handle food safely.	_____
6.	Generally, foodborne illness is rare.	_____
7.	People who are healthy rarely get foodborne illness.	_____
8.	Anyone can get foodborne illness if they eat unsafe food.	_____
9.	Healthy young children have a higher risk for foodborne illness than do healthy adults.	_____
10.	Foodborne illness can cause death.	_____
11.	Foodborne illness can cause serious health problems.	_____

III. OPINION ABOUT THE BOOKLET

1. Did you read the booklet, What You Can't See Can Hurt Your Kids and You?
   ___ All of it ___ Part of it ___ None of it

2. Put a "√" next to the topics ***you read*** in the booklet:

   ___ Regulations (p. 2)
   ___ Foodborne Illness (p. 3)
   ___ Unsafe Food (p. 4-5)
   ___ Storing Food (p. 6-7)
   ___ Cooking (p. 8-9)
   ___ Cleaning Up (p. 10-11)
   ___ Snack and Meal Time (p. 12-13)
   ___ Field Trips (p. 14-15)
   ___ Caring for Infants/Toddlers (p. 16-17)

3. Did you ***learn anything new*** after reading the booklet? ___ Yes ___ No

   If yes, what?

   _____

   _____

   _____

4. Put a "√" next to the topics you thought were ***useful*** to you?

   ___Regulations (p. 2)
   ___Foodborne Illness (p. 3)
   ___Unsafe Food (p. 4-5)
   ___Storing Food (p. 6-7)
   ___Cooking (p. 8-9)
   ___Cleaning Up (p. 10-11)
   ___Snack and Meal Time (p. 12-13)
   ___Field Trips (p. 14-15)
   ___Caring for Infants/Toddlers (p. 16-17)

5. Put a "√" next to the topics you thought were ***not*** useful to you?

   ___Regulations (p. 2)
   ___Foodborne Illness (p. 3)
   ___Unsafe Food (p. 4-5)
   ___Storing Food (p. 6-7)
   ___Cooking (p. 8-9)
   ____Cleaning Up (p. 10-11)
   ____Snack and Meal Time (p. 12-13)
   ____Field Trips (p. 14-15)
   ____Caring for Infants/Toddlers (p. 16-17)

6. If you thought any topic was ***not*** useful, explain why?

_____

_____

_____

7. Did you like the layout of the booklet? ___ Yes ___ No

If no, why?

_____

_____

_____

8. What did you like best about the booklet?

_____

_____

_____

9. Was the booklet easy to read? ___ Yes ___ No

10. If you answered ***no*** to question 9, put a "√" next to the topics you thought were ***not*** easy to read?

___Regulations (p. 2)
___Foodborne Illness (p. 3)
___Unsafe Food (p. 4-5)
___Storing Food (p. 6-7)
___Cooking (p. 8-9)
___Cleaning Up (p. 10-11)
___Snack and Meal Time (p. 12-13)
___Field Trips (p. 14-15)
___Caring for Infants/Toddlers (p. 16-17)

11. If you could, what would you change about the booklet?

_____

_____

_____

_____

THANK YOU!!

Return this survey and raffle ticket to:

Angela Fraser
Dept. of Food Science and Human Nutrition
Michigan State University
165 S. Anthony Hall
East Lansing, MI 48824

II. Posttest sent to the experimental groups within the day care home providers sample

I. HANDLING FOOD SAFELY

Write any number from 0% to 100% (where 100% = all of the time and 0% = never) to indicate how often you:

0%<----->100%

If you do not care for infants, go to question 4.

1. Wash hands before and after diapering children. _____
2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____
3. Feed a baby directly from a jar of baby food. _____

If you only serve cold meals, go to question 9.

4. Check the temperature of meat, fish, poultry, or eggs immediately after cooking. _____
5. Refrigerate leftovers that contain meat, fish, poultry, or eggs in shallow containers. _____
6. Check the temperature of food immediately after reheating. _____
7. Refrigerate leftovers that contain meat, fish, poultry, or immediately after the meal. _____
8. Thaw frozen food in the refrigerator or microwave oven. _____

0%<------>100%

If you only use disposable cups, plates, and utensils, go to question 10.

9. Sanitize dishes and utensils with a bleach solution after every use. _____

10. Wash your hands before you handle food. _____

11. Check the temperature of the refrigerator. _____

12. Clean and sanitize the eating table ***before*** children eat. _____

13. Throw out uneaten food that has been served to the children. _____

14. Store packaged food in a clean place other than the floor. _____

15. Throw out cans, jars, and packaged foods with dents, bulges, or tears. _____

16. Wash raw fruits or vegetables before serving. _____

17. Sanitize cutting boards with a bleach solution. _____

18. Have children wash their hands before eating. _____

19. Taste food to determine if it is safe to eat. _____

II. OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (0 = no agreement and 5 = complete agreement) to describe how much you agree with each statement.

		0 <------> 5
1.	Foodborne illness is almost 100% preventable if you handle food safely.	_____
2.	Foodborne illness is usually caused by food that was contaminated when it was bought.	_____
3.	I cannot prevent children from getting foodborne illness while in my care.	_____
4.	It is my fault if children get sick from the food I serve to them.	_____
5.	Foodborne illness can be prevented if I handle food safely.	_____
6.	Generally, foodborne illness is rare.	_____
7.	People who are healthy rarely get foodborne illness.	_____
8.	Anyone can get foodborne illness if they eat unsafe food.	_____
9.	Healthy young children have a higher risk for foodborne illness than do healthy adults.	_____
10.	Foodborne illness can cause death.	_____
11.	Foodborne illness can cause serious health problems.	_____

III. OPINION ABOUT THE BOOKLET

1. Did you read the booklet, What You Can't See Can Hurt Your Kids and You?
   ___ All of it ___ Part of it ___ None of it

2. Put a "√" next to each ***topic you read*** in the booklet:

   ___ Regulations (p. 2)
   ___ Foodborne Illness (p. 3)
   ___ Unsafe Food (p. 4-5)
   ___ Storing Food (p. 6-7)
   ___ Cooking (p. 8-9)
   ___ Cleaning Up (p. 10-11)
   ___ Snack and Meal Time (p. 12-13)
   ___ Field Trips (p. 14-15)
   ___ Caring for Infants/Toddlers (p. 16-17)

3. Did you ***learn anything new*** after reading this booklet? ___ Yes ___ No

   If yes, what?

   _____

   _____

4. Put a "√" next to the topics you thought were useful to you?

   ___Regulations (p. 2)
   ___Foodborne Illness (p. 3)
   ___Unsafe Food (p. 4-5)
   ___Storing Food (p. 6-7)
   ___Cooking (p. 8-9)
   ___Cleaning Up (p. 10-11)
   ___Snack and Meal Time (p. 12-13)
   ___Field Trips (p. 14-15)
   ___Caring for Infants/Toddlers (p. 16-17)

5. Put a "√" next to the topics you thought were ***not*** useful to you?

   ___Regulations (p. 2)
   ___Foodborne Illness (p. 3)
   ___Unsafe Food (p. 4-5)
   ___Storing Food (p. 6-7)
   ___Cooking (p. 8-9)
   ____Cleaning Up (p. 10-11)
   ____Snack and Meal Time (p. 12-13)
   ____Field Trips (p. 14-15)
   ____Caring for Infants/Toddlers (p. 16-17)

6. If you thought a topic was ***not*** useful, explain why?

_____

_____

_____

7. Did you like the layout of the booklet? ___ Yes ___ No

If no, why?

_____

_____

_____

_____

8. What did you like best about the booklet?

_____

_____

9. Was the booklet easy to read? ___ Yes ___ No

10. If you answered ***no*** to question 9, put a "√" next to the topics you thought were ***not*** easy to read?

___Regulations (p. 2)
___Foodborne Illness (p. 3)
___Unsafe Food (p. 4-5)
___Storing Food (p. 6-7)
___Cooking (p. 8-9)
___Cleaning Up (p. 10-11)
___Snack and Meal Time (p. 12-13)
___Field Trips (p. 14-15)
___Caring for Infants/Toddlers (p. 16-17)

11. If you could, what would you change about the booklet?

_____

_____

_____

THANK YOU!!

Return the survey and raffle ticket to:

Angela Fraser
Dept. of Food Science and Human Nutrition
Michigan State University
165 S. Anthony Hall
East Lansing, MI 48824

III. Posttest sent to the control groups within the child care center teachers sample

I. HANDLING FOOD SAFELY

Write any number from 0% to 100% (where 100% = all of the time and 0% = never) to indicate how often <u>you</u>:

0%<----->100%

If you do NOT care for infants, go to question 4.

1. Wash hands before and after diapering children. _____
2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____
3. Feed a baby directly from a jar of baby food. _____
4. Wash your hands before you handle food. _____
5. Clean and sanitize the eating table ***before*** children eat. _____
6. Throw out uneaten food that has been served to children. _____
7. Have children wash their hands before eating. _____
8. Taste food to determine if it is safe to eat. _____

II. OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (0 = no agreement and 5 = complete agreement) to describe how much you agree with each statement.

		0 <------> 5
1.	Foodborne illness is almost 100% preventable if you handle food safely.	_____
2.	Foodborne illness is usually caused by food that was contaminated when it was bought.	_____
3.	I cannot prevent children from getting foodborne illness while in my care.	_____
4.	It is my fault if children get sick from the food I serve to them.	_____
5.	Foodborne illness can be prevented if I handle food safely.	_____
6.	Generally, foodborne illness is rare.	_____
7.	People who are healthy rarely get foodborne illness.	_____
8.	Anyone can get foodborne illness if they eat unsafe food.	_____
9.	Healthy young children have a higher risk for foodborne illness than do healthy adults.	_____
10.	Foodborne illness can cause death.	_____
11.	Foodborne illness can cause serious health problems.	_____

IV. Posttest sent to the control groups within the day care home providers sample

I. HANDLING FOOD SAFELY

Write any number from 0% to 100% (where 100% = all of the time and 0% = never) to indicate how often you:

0%<----->100%

If you do not care for infants, go to question 4.

1. Wash hands before and after diapering children. _____
2. Let infants drink from a bottle that has been out of the refrigerator for more than one hour. _____
3. Feed a baby directly from a jar of baby food. _____

If you only serve cold meals, go to question 9.

4. Check the temperature of meat, fish, poultry, or eggs immediately after cooking. _____
5. Refrigerate leftovers that contain meat, fish, poultry, or eggs in shallow containers. _____
6. Check the temperature of food immediately after reheating. _____
7. Refrigerate leftovers that contain meat, fish, poultry, or immediately after the meal. _____
8. Thaw frozen food in the refrigerator or microwave oven. _____

If you only use disposable cups, plates, and utensils, go to question 10.

9. Sanitize dishes and utensils with a bleach solution after every use. _____
10. Wash your hands before you handle food. _____
11. Check the temperature of the refrigerator. _____
12. Clean and sanitize the eating table ***before*** children eat. _____

13. Throw out uneaten food that has been served to the children. _____

14. Store packaged food in a clean place other than the floor. _____

15. Throw out cans, jars, and packaged foods with dents, bulges, or tears. _____

16. Wash raw fruits or vegetables before serving. _____

17. Sanitize cutting boards with a bleach solution. _____

18. Have children wash their hands before eating. _____

19. Taste food to determine if it is safe to eat. _____

II. OPINIONS ABOUT HANDLING FOOD SAFELY

Write any number from 0 to 5 (0 = no agreement and 5 = complete agreement) to describe how much you agree with each statement.

		0 <------> 5
1.	Foodborne illness is almost 100% preventable if you handle food safely.	_____
2.	Foodborne illness is usually caused by food that was contaminated when it was bought.	_____
3.	I cannot prevent children from getting foodborne illness while in my care.	_____
4.	It is my fault if children get sick from the food I serve to them.	_____
5.	Foodborne illness can be prevented if I handle food safely.	_____
6.	Generally, foodborne illness is rare.	_____
7.	People who are healthy rarely get foodborne illness.	_____
8.	Anyone can get foodborne illness if they eat unsafe food.	_____
9.	Healthy young children have a higher risk for foodborne illness than do healthy adults.	_____
10.	Foodborne illness can cause death.	_____
11.	Foodborne illness can cause serious health problems.	_____

THANK YOU!!

Return this survey and raffle ticket to:

Angela Fraser
Dept. of Food Science and Human Nutrition
Michigan State University
165 S. Anthony Hall
East Lansing, MI 48824

APPENDIX F

Internal and external threats to validity

APPENDIX F

Internal and external threats to validity

Factors affecting internal and external validity of a research design (Campbell and Stanley, 1963).

Factor	Definition
Internal validity	
History	Specific events occurring between the first and second measurement (pretest and posttest) in addition to the experimental variable.
Maturation	Processes within the respondents operating as a function of the passage of time that are not specific to the particular events. This includes growing older, growing hungrier, growing more tired, and the like.
Testing	Effects of taking the pretest upon the scores of the posttest.
Instrumentation	Changes in the calibration of the evaluation instrument or changes in the observers or scoring used might produced changes in the obtained measurements.
Statistical regression	Operating where groups have been selected on the basis of their extreme scores
Selection	Biases resulting in differential selection of respondents for the comparison groups.
Experimental mortality	Differential loss of respondents from the comparison groups

Factors affecting internal and external validity of a research design (Campbell and Stanley, 1963).

Factor	Definition
External validity	
Interaction effect	Effect in which a pretest might increase or decrease the of testing andrespondent's sensitivity or responsiveness to the experimental the intervention variable and thus make the results obtained for a pretested population unrepresentative of the effects of the experimental variable for the unpretested universe from which the experimental respondents were selected.

APPENDIX G

Data collection procedures and timeline

APPENDIX G

Data collection procedures and timeline

The following describes the chronological order of procedures used to collect data from the two samples -- Michigan family/group day care homes and Michigan child care centers.

OCTOBER 27, 1994

Pretested experimental group

The pretest, a letter of explanation about the study and a stamped addressed return envelope were sent to the 600 day care home providers randomly assigned to this group and to the 600 center teachers randomly assigned to this group. A raffle ticket was also enclosed to increase response rate. The drawing for the raffle was to be held on February 15, 1995. One $50 gift certificate to Toys R Us would be awarded to a center teacher and one $100 gift certificate to Toys R Us would be awarded to a day care home provider.

Pretested control group

The pretest, a letter of explanation about the study and a stamped addressed return envelope were sent to the 100 home providers randomly assigned to this group and to the 100 center providers randomly assigned to this group. A raffle ticket was also enclosed to increase response rate. The drawing for the raffle was to be held on February 15, 1995. One $50 gift certificate to Toys R Us would be awarded to a center teacher and one $100 gift certificate to Toys R Us would be awarded to a day care home provider.

The cover letter sent to subjects from the pretested experimental and pretested control groups within the center sample requested the center director to assign a teacher to participate in the study.

The participants were asked to return their pretests by November 21, 1994.

NOVEMBER 11, 1994

Pretested experimental group

A follow-up postcard was sent to all nonrespondents in the day care home providers sample and in the child care center teachers sample.

Pretested control group

A follow-up postcard was sent to all nonrespondents in the daycare home providers sample and in the child care center teachers sample.

NOVEMBER 21, 1994

Pretested experimental group

Respondents in both samples (day care homes and child care centers) who completed the pretest were sent the posttest, a letter of explanation, and the booklet **What You Can't See Can Hurt Your Kids and You!** Respondents were given until December 15, 1994 to read the booklet, complete the posttest, and return it to Michigan State University.

Pretested control group

Respondents in both samples (daycare home providers; child care center providers) who completed the pretest were sent the posttest and a letter of explanation. Respondents were given until December 15, 1994 to complete the posttest and return it to Michigan State University.

Nonpretested experimental group

Respondents randomly assigned to this group (200 day care home providers; 200 child care center teachers) were sent the posttest, a letter of explanation, and the booklet **What You Can't See Can Hurt Your Kids and You!** Respondents were given until December 15, 1994 to read the booklet, complete the posttest, and return it to Michigan State University. A raffle ticket was also enclosed to increase response rate. The raffle for child care center teachers was for a $50 gift certificate to Toys R Us; for the day care home providers it was a $100 gift certificate to Toys R Us.

Nonpretested control group

Respondents randomly assigned to this group (100 day care home providers; 100 child care center teachers) were sent the posttest, a letter of explanation, and a stamped addressed return envelope. Respondents were given until December 15, 1994 to complete the posttest and return it to Michigan State University. A raffle ticket was also enclosed to increase response rate. The raffle for child care center teachers was for a $50 gift certificate to Toys R Us; for the day care home providers it was a $100 gift certificate to Toys R Us

The cover letter sent to child care centers requested the center director to assign

a teacher to participate in the study.

JANUARY 3, 1995

All groups for both samples

A second mailing, which consisted of a 19 cent reminder postcard, was sent to all nonrespondents to the posttest. The nonrespondents were asked to return the posttest immediately.

JANUARY 25, 1995

All groups for both samples

A third mailing, which consisted of an explanation letter and a second copy of the posttest, and a stamped addressed envelope were mailed to all non-respondents. They were asked to return the survey as soon as possible.

APPENDIX H

Responses about the acceptability of the booklet by a sample of Michigan day care home providers

Daycare Homes: OPINION ABOUT THE BOOKLET

1. **Did you read the booklet, What You Can't See Can Hurt Your Kids and You?**

Pretested Experimental Group

104	**All of it**
15	**Part of it**
3	**None of it**
1	**No answer**

Nonpretested Experimental Group

42	**All of it**
11	**Part of it**
3	**None of it**

3. **Did you *learn anything new* after reading the booklet?**

Pretested Experimental Group

93	**Yes**
25	**No**

Group B

43	**Yes**
9	**No**

If yes, what?

Mold

- To throw away the jar of jam if there is mold -- cut off mold on cheese can still use rest the cheese.
- I though you could scrape mold off of jelly. We always did when I was kid and chew the wax.
- Mold "roots" and other facts on mold.
- Mold roots might have spread to other slices
- About which moldy foods to throw completely out
- Mold on cheese.
- Mold stems out into other parts of bread in a loaf.

Foodborne illness

- I never heard about foodborne illness before.
- What foodborne illness is
- Foodborne illness
- Symptoms of foodborne illness.
- How foodborne illness is caused and how you can help prevent it.
- About foodborne illness
- I never knew how serious foodborne illness really was -- and I learned a lot more precautions I can take.'
- Foodborne illness
- Facts about foodborne illness.
- About foodborne illness.
- More about foodborne illness
- Foodborne illness is very common
- All about foodborne illness, didn't think it happened often.
- I learned a lot about foodborne illness that I really never thought about before.
- What foodborne illness is found in (soil, water, humans animals and birds)
- About foodborne illness.
- Symptoms of foodborne illness
- About foodborne illness and how to help prevent it.
- Several items regarding foodborne illness.
- 9000 people die annually from foodborne illness.
- That foodborne illness can cause death
- Foodborne illness symptoms.
- I didn't know much about the foodborne illness and how to prevent it --
- I learned more things to do safer.
- How evasive foodborne illnesses can be, i.e. can't see, smell, or taste toxins in food.

- Learned more about foodborne illness and how to prevent.
- Foodborne illness info was informative and I will refer to it and keep with my cookbooks!
- How foodborne illness stands
- Foodborne illnesses.
- Mostly about illness

Temperatures

- I should check all hot foods with a thermometer.
- Using a food thermometer more often.
- Refrigerator temperature
- Not to refrigerate food that was served but not eaten.
- That I need to check the temperature of food immediately after cooking and after reheating.
- Checking refrigerator.
- Temperatures for cooking and proper food temperatures.
- Learned more about the correct cooking temperatures of meat and leftover foods from the charts on page . It was good to review all. freezer temperatures and refrigeration temperatures; cooking temperatures.
- The temperatures for hot foods and cold foods and tips to keep them at proper temperatures.
- p. 8 temperature reheating;
- About refrigeration temperatures, cold spots in microwave cooking. Meat temperatures should be checked.
- How important temperatures are to food and makes us more aware of what can happen.
- Before I had never checked the temperature of meat or leftovers.
- Put cooked food into shallow pans refrigerate immediately and cover one hour later.
- Safe temps
- The exact temperatures refrigerators should be and the exact temperatures food should be at when cooked.
- How important it is to check temperatures of food.
- internal temperatures -- cooking
- Reheat temperature of microwave food should be at least 165°F.
- Correct temperature for foods.
- Some basic food handling tips on temperatures of food.
- That we should from time to time check the temps of our refrigerator and food after we cook it. Pages 3, 6, and 7 were very helpful?

Cleaning and sanitizing

- I will always sanitizes utensils and feeding areas.
- How to sanitize tabletops
- Recipe for sanitizing
- That you can not use scented bleaches for sanitizing.
- Why can't I use Fresh scent bleach?
- Sanitizing hand washed dishes in a bleach solution.
- I use a dishwasher and don't use bleach is this ok for dishes?
- The sanitizing a changing table after each diapering.
- To always "air dry" dishes. There was no mention of towel drying anything!
- The solution for sanitizing -- what exactly foodborne illness is all about.
- I need to use bleach to sanitize.
- I should sanitize dishes and utensils after every use and the eating table before they eat. I only sanitized the table when a child is sick but now I will always.
- Cleaning up topics
- The importance of sanitizing with bleach.
- Sanitize solution.
- Exact ratio for water/bleach sanitizing solution.
- To sterilize everything before serving food on a dish; many other things too.
- I never heard of immersion sanitizing.
  how long you can keep the water and bleach -- I use it sometimes.
- How to sterilize countertops, high chair trays, and dishes.
- Sanitizing solutions and how to sanitize.
- Immersion sanitizing; I use an automatic dishwasher with detergent containing bleach.
- Proper way to mix sanitizing solution
- Immersion sanitizing
- Method of sanitization
- To sterilize teething toys daily. I knew it should be often.
- I did not know how or when to sanitize countertops etc.
- How to mix a sterilizing solution
- That I need to sanitize more
- Cleaning up
- Sanitizing solution for surfaces and no rinsing off solution.

Leftovers

- Shallow dishes should be used for leftovers.
- About leftovers -- refrigerate quickly -- I've let cool first! They were all useful.
- Leftovers kept 2 days only
- Shallow food storage containers help reduce foodborne illness.

- Put cooked food into shallow pans refrigerate immediately and cover one hour later.
- Not to save leftovers too long (2 days) using shallow containers for food storage
- The depth of refrigerator containers of leftovers.
- The importance of sanitation procedures

Storage

- What to do how to store food.
- Storing food
- The different ways to store food
- Foods (canned goods) should not be stored on the floor.
- Proper storage of food.
- Foods (canned goods) should not be stored on the floor.
- More about proper storage of foods/leftovers
- p.6 Never store under sink because of leaks

Cooking/reheating

- I was not aware reheating would not kill toxins
- Heating food in microwave thoroughly.

Washing fruits and vegetables

- Not using soap to wash vegetable peels (water alone doesn't take off pesticide residues.
- Not to wash veggies in soap

Infant feeding

- Not to feed baby's from the jar.
- About feeding from jar
- Caring for infants
- To throw out unused baby food within 36 hours after opening.
- Feeding time of infant should be less than one hour.
- I was unaware I could not feed a baby from a jar of food.
- Baby formula. When I used to keep baby's. If they did not drink all of there milk I would give them the rest later.
- The information on breast milk

Field trips

- Child care centers are not permitted to serve meat, tuna or egg sandwiches, milk, cheese, yogurt, opened fruit or peeled fruit and vegetables on field trips.
- Extra ideas for food on field trips.
- Cannot take meat, tuna, or cheese sandwiches on a field trip.
- I did not know that there were any restrictions on the type of food a daycare was/is allowed to take on a field trip. I found the entire booklet interesting.
- Field trip foods

Consuming raw eggs

- Batter spoons to be licked because of raw eggs.
- Nobody should be eating cookie dough or other raw egg batters.
- Never let children taste or lick bowl or spoon from a recipe containing raw eggs.

Indicators of unsafe food

- P. 5 spurting liquid, bubbles/pets and food preparation
  Sources of cross-contamination

Toxins

- Bacteria form toxins, cooking does not destroy toxins
- I thought bacteria and toxins were the same.
- Cooking does not destroy toxins.
- I learned that toxins cannot be destroyed.

Thermoses

- About food left in thermos too long
- p.15 Hot food can be kept in thermos only 2 hours.
- Can't keep foods hot in a thermos for as long as I thought (I thought at least 4 hours)

Miscellaneous

- Things I know but have forgotten through the years, and each year brings something new out.
- The food program has provided many booklets on these subjects and I've read all of them.
- How important it is in serving foods.
- That you can never be too careful or too clean.
- Already aware of these facts.
- How quickly food can become dangerous
- I may not be doing enough to prevent foodborne illness.
- A lot of valuable safety measures to all aspects of ensuring that families can eat as safe as possible.
- Some of the regulations
- If I have learned new things in every topic
- That I've grown a bit careless about sanitation and need to be more conscientious.
- There were things in the book I thought I knew but didn't
- Lots of new things that I didn't understand
- I have read so much about food that sometimes I feel the state overdoes it.
- My husband went to college and learned a lot about foods. I have never had any one get sick in my home due to food.
- It's very refreshing to keep up date myself and I learned a lot about bacteria growth.
- I learned how to be a better day care provider
- I am considering never eating again.
- I don't know if I would say new but definitely renewed.
- There were some things I thought were one way but did not know for sure until I saw it in your booklet.
- More caution needs to be taken while doing anything with food. Entire booklet is an excellent reminder to use safe practices.
- The caring and storing safely of food and cooking and cleaning properly
- I feel I learned a little about each topic.

4. Put a '√" next to the topics you thought were *useful* to you?

Pretested Experimental Group

49 **Regulations (p. 2)**	79 **Cleaning Up (p. 10-11)**
87 **Foodborne Illness (p. 3)**	61 **Snack and Meal Time (p. 12-13)**
79 **Unsafe Food (p. 4-5)**	52 **Field Trips (p. 14-15)**
68 **Storing Food (p. 6-7)**	60 **Caring for Infants/Toddlers (p. 16-17)**
66 **Cooking (p. 8-9)**	

Nonpretested Experimental Group

18 **Regulations (p. 2)**	26 **Cleaning Up (p. 10-11)**
34 **Foodborne Illness (p. 3)**	22 **Snack and Meal Time (p. 12-13)**
28 **Unsafe Food (p. 4-5)**	20 **Field Trips (p. 14-15)**
27 **Storing Food (p. 6-7)**	27 **Caring for Infants/Toddlers (p. 16-17)**
27 **Cooking (p. 8-9)**	

5. Put a '√" next to the topics you thought were *not* useful to you?

Pretested Experimental Group

21 **Regulations (p. 2)**	4 **Cleaning Up (p. 10-11)**
1 **Foodborne Illness (p. 3)**	7 **Snack and Meal Time (p. 12-13)**
4 **Unsafe Food (p. 4-5)**	18 **Field Trips (p. 14-15)**
4 **Storing Food (p. 6-7)**	12 **Caring for Infants/Toddlers (p. 16-17)**
3 **Cooking (p. 8-9)**	

Nonpretested Experimental Group

6 **Regulations (p. 2)**	3 **Cleaning Up (p. 10-11)**
0 **Foodborne Illness (p. 3)**	3 **Snack and Meal Time (p. 12-13)**
2 **Unsafe Food (p. 4-5)**	9 **Field Trips (p. 14-15)**
2 **Storing Food (p. 6-7)**	5 **Caring for Infants/Toddlers (p. 16-17)**
3 **Cooking (p. 8-9)**	

6. If you thought any topic was *not* useful, explain why?

Regulations

- As I reread Regulations I did find it useful.
- Regulations are already covered by the state
- The regulations and foodborne illness sections. I was already familiar with.
- Already have cop of regulations; always take foods that are neither are hot or cold on trips -- do not care for infants in my home.
- Regulations -- I knew when I got my license.
- Regulations have been covered many other times, elsewhere.
- Regulations are usually given to you when your getting licensed. It was okay, I just knew all about it.

- Because I received a copy of the regulations at the time of my licensing I wasn't interested in going over it again.
- Regulations are already printed in the rule book. We don't do field trips.
- Regulations -- only because I have my copy of them.
- The regulations are well documented in our licensing books and literature however, the detail of the other topics is not as specific as they are in the survey book.

Infants and Toddlers

- Caring for infants/toddlers was not new information
- I don't have infants.
- Do not care for infants or toddlers.
- I don't usually care for children under the age of 3
- I already knew a lot of this information.
- They were all useful to me! We can use all the information we can get.
- Things I already knew.

Field Trips

- We do not take a lot of field trips
- I don't take my daycare children on field trips because the parents don't like children to run all over and it is too much of a hassle.
- I don't take the kids on field trips.
- We don't take field trips
- I do not take field trips -- we have live in a wooded area so our "trips are through the woods and fields around here.
- Don't go on trips.
- There is too much age difference in what they are interested in (field trips)
- I feel that I know what not to take on field trips
- I serve only food packed by parents -- easily refrigerated and/or stored safely to be microwaved for meals.
- We usually don't take field trips.
- Field trips - -seemed "common sense" and not applicable
- We don't take food on our field trips.
- Our group does a lot of picnics, so know a lot of preparations.
- I do not take field trips but the information will help in packing my own children's lunches.
- We eat at McDonalds for field trips instead of using a cooler.
- There is too much age difference in what they are interested in (field trips)
- I do not take field trips.

Cooking

- I serve only food packed by parents -- easily refrigerated and/or stored safely to be microwaved for meals.
- I don't know of anyone who takes the time to check temperature of food. Always cook food well done so there are no doubts.

Miscellaneous

- We day care providers have regulations thrown at us all of the time so I felt that it wasn't necessary. In my eyes cleaning up is common sense and good hygiene.
- The only thing I didn't know was air drying. I always rinsed off the sanitizing solution.
- I've read the hole book, enhanced what I knew. I think that can't hurt anybody.
- Already was aware of them.
- All are useful, but not new to me.
- I already knew the information
- I am enrolled with ACD and they keep me up to date on regulations.
- I thought they were all useful, but I was already aware of most things.
- Storing food, snack and meal time
- Unsafe food had mainly common sense information and so did storing food. Snack and meal time outlined our daily procedure.
- Everything was useful. If I didn't learn something new at least I was reminded.
- I worked in food service before daycare. I work mostly under that knowledge not what given to me by the DSS
- Snack and meal sections repetitious of previous sections.
- I have all that information and read it periodically to always be updated.
- They were all very useful; I just know about most of it from other classes and books.
- Should be amount of time raw meat should be kept.
- Repeat of information printed almost everywhere
- I am also a mom and a competent person besides a daycare provider.
- I liked all of the topics.
- Already knew most of the topics
- Because I keep my home clean, and know how to sanitize my home. I am not on the food program ad I feed good meals and snacks.

7. Did you like the layout of the booklet?

Pretested Experimental Group
117 **Yes**
1 **No**

Nonpretested Experimental Group
50 **Yes**
0 **No**

If no, why?

- Could go more into kinds of bacteria and toxins.
- The dark shaded areas were hard to read -- otherwise it was find.

8. What did you like best about the booklet?

Reading

- It was straightforward.
- Easy to read and understand brief and to the point.
- Very simple and to the point. I don't have much spare time and this was a quick and to the point.
- Large print and easy to read
- Explains well and short
- Simplicity
- Highlighted most important parts
- Very concise with lots of pertinent, factual information.
- Easy to understand. Refresh memory
- Concise, simple to read and understand. Set up to help not to judge.
- Easy to read
- Each topic is direct and to the point. No babbling or redundant information.
- The way you emphasized topics in different ways for each topic.
- It was laid out easily to read and follow.
- Very much to the point.
- It is very easy to read
- Easy and quick to read
  Easy to read and understand
- Set-up, easy to read -- fast to read.
- Easy to read

- Brief and to the point. Minimal amount of reading time required.
  The booklet was concise and to the point and would make a good reference for future use.
- It was short and to the point -- easy to read -- large print.
- The excellent information, easy and to the point. Well covered.
- Very easy to understand and very informative.
- Easy to read and nice layout.
- It was easy to read and understand
- The way the whole booklet was outlined; it was easy to understand.
- The bold print and very easy to read format.
- Easy to understand
- Very easy to comprehend
- Layman terms -- easy to read.
- It is very informative and easy to understand.
- I thought it was a real easy format to read and understand It will be nice to use for a reference book.
- It's easy to read and understand.
- Easy to use, topics laid out in good form; lots of helpful information.
- Easy to read and understand. All of it! I repeated things it helps me to remember better!
- Being made available to me! Large print -- basic and to the point -- quick to read -- who's got time for a long reading time. Short topics -- so one can be read between children's needs.
- How easy it is to understand and the excellent ways all the topics are explained in layman terms.
- Easily readable; basics put in dark section
- Easy, brief, and to the point.
- Easy to read, layout
- Easy and fast to read and reference. Large print sanitizing solutions (recipes)
- Each section was concise to the point quick to read. something I could use as a quick reference.
- It was very easy to read and understand. The whole booklet. Everything was to the point.
- Short and to the point.
- It's short, simple to read and to the point.
  Quick to read and easily understandable.
- Large easy to read print. Each topic covered briefly but thoroughly.
- Easy to read. Not too long.
- Easy to read
  The format, layout, size of print, Nice job!!!
- It was easy to read and understand
- All the information was very informative.
- The information was concise, easy to read, pertinent to my situation and covered many topics.
- It's easy to read.

- It explains thoroughly, details a lot of important issues.
- Fact that some things are repeated! Reminders thought it was very educational.
- It's short easy to read.
- Easy to read and understand., important items underlined. Thank you!
- Short and to the point!

Layout

- The booklet was well laid out and contained good, basic information. After nine years of attending conferences, trainings and workshops, I had been exposed to this information before. Thanks for the booklet.
- Foods (canned goods) should not be stored on the floor.The layout -- it was easy, simple to read -- not confusing!!
- Large print and condensed
- The gray areas, stating the important facts.
- The italicized gray material, which could be cut out and posted.
- I enjoyed the large print and bold headings
- Big print too the point.
- Bold titles and subtitles (make it easy to reference),
- It is well organized. The sections are clearly labeled only pertinent information is listed. It is thorough.
- I liked the way it was divided into sections/topics and the shaded interest points.
- Condensed information -- only what you really need to know large print -- interesting booklet
- Highlighting of important, noteworthy items.
- The grayed information boxes.
- The highlighted "gray" areas
- Large print -- in laymen's terms.
- The gray shaded area of quick reference.
  Color of cover

Information

- What step to take to prevent my children getting sick from a contaminated food.
- Everything
- Tips on child care
- The information on food and the importance of food safety; a lot of things I didn't know I wish more information like that could be brought to other people.
- Lots of different topics in the booklet
- Informative
- Reheating temperature and how important a meat thermometer is. I will get one.
- It was very educational

- Learning about refrigerator and freezer temperatures -- food temperatures and cleaning
- Very informative
- This booklet is very informative. I will keep this on hand to review and to finish reading thoroughly.
- Helpful and informative.
- All the information was very informative.
- It was very informative.
- Had good information.
- I did like the section with the Cooking temperatures in it. I can never remember what the temperature of these foods are supposed to be.
- Sanitizing, some time in a busy day you forget to do something like that.
- All the information you were able to cover in such a short booklet.
- The unsafe food. Foodborne illness. Storing food, cooking cleaning up. All of the book.
- Field trips
- It was all very informative. I was very pleased with the whole book
- I thought the booklet was very informative. We all need to be up to date on new things as well as old things this booklet was very helpful. I like all informative information.
- Information on food topics, storing, cooking, etc.
- Brief and informative.
- A lot of good informative information
- It's very informative. Especially for someone who is unfamiliar with these illnesses with food.
- The highlighted sections and the directions for sanitizing solution.
- The layout made it easy to read and to understand; everything
- The fact that it provided necessary info in an easy to read format.
- Very helpful.
- Don't wash hands (after diaper change) in the same sink you use for food prep. I showed to one of the daycare moms to back up an argument.
- Storing food and foodborne illness.
- The information on regulations and sanitizing and also checking temperatures of foods.
- Foodborne illness
- All of the topics were helpful and has information to how this can happen with foodborne illness and how to help prevent it.
- Information was good.
- Foodborne illness/viruses/bacteria/unsafe food/cleaning/sanitation. Everything in booklet very helpful!
- It will be handy quick complete reference for something you may have forgotten or are unsure of -- e.g. internal temperature of cooked ground beef.
- Foodborne illness -- my son is in the army and has gotten sick twice from restaurant food.
- Very informative in all areas of food preparation.

- How informative it was. It was very useful.

Miscellaneous

- Everyone should know about this. This reinforced information I just learned in an 8 week video series from the University of Idaho -- through our county health extension. Excellent!!
- The whole book was interesting.
- Little things were brought out that you some time don't think about -- field trip foods, temperatures, and cooking.
- I enjoy and can use any info on child care
- All of it I have been in daycare for years and have never had this kind of information. I thought it was great. Now I would like to know how I did on the 1st part. Now that I had the book to read to see how much I was or wasn't doing right.
- The whole book.
- It was free
- I liked the hole thing I learned something on each page. If you have more books that would help to run my day care please mail them to me.
- Everything
- It reminded me of things you should do, but sometimes get lazy at.
- I liked the book and felt it was a good overview of what is expected for food safety. It is a very good review.
- The whole booklet was a great way to address "preventative medicine" in a way for the holiday season also!
- I learned a lot of things -- sanitizing, cleaning up. common sense tells us a lot but you never knew it all. Thank you!
- It reinforced items that I already knew about.
- I liked all of it.
- It refreshes my memory.
- I felt there was a lot of repeat and I know that's how kids learn, but we are adults.
- It went in to some good things I did not know and It was good to read on. These things.
- Most of this booklet is jus common sense, but it is nice just to review and refresh our minds.
- The very idea that this information is available to those who are just beginning in day care and to those of us who think we know it all -- when we really do not!
- You could review all of the habits you already have formed over the years!
- It's always good to be reminded of good habits.

9. Was the booklet easy to read?

Pretested Experimental Group
36 **Yes**
0 **No**

Nonpretested Experimental Group
52 **Yes**
0 **No**

10. If you answered *no* to question 9, put a "√" next to the topics you thought were *not* easy to read?

Group A and C

0 **Regulations (p. 2)**
0 **Foodborne Illness (p. 3)**
0 **Unsafe Food (p. 4-5)**
0 **Storing Food (p. 6-7)**
0 **Cooking (p. 8-9)**
0 **Cleaning Up (p. 10-11)**
0 **Snack and Meal Time (p. 12-13)**
0 **Field Trips (p. 14-15)**
0 **Caring for Infants/Toddlers (p. 16-17)**

11. If you could, what would you change about the booklet?

Negative Statement

- The questions with percentage and 0-5 were hard to answer. A yes or no would have been easier.
- I think having to do all tests, information rules, regulations keeps many people from wanting to be licensed. It is sad that because of the cost of day care to licensed, it is easier to be unlicensed.
- I don't like the survey part II. I don't like number 0-5. I'd rather write yes, no maybe, etc.
- Sending it out like in January or February when you have more time to sit down other than at this holiday season.
- I don't like the idea of using bleach solution.

Positive Statements

- The only thing I would change is why you did not mail it out before now. I would have a safer day care.
- Foods (canned goods) should not be stored on the floor.Nothing -- it was excellent!! Thank you.
- I liked it, it was easy reading and the facts to the point and very clear.

- Nothing. It was easy to read and wasn't one of those books with two hundred pages and saying the same thing that you said in seventeen pages. Thanks!
- Nothing, except don't put the shaded parts in. They were hard to read.
- Nothing -- it's easy to read and packed with info.
- I would not change the booklet. I run a group home and this booklet was great to have my employees read. I think one should be sent to every home especially group homes.
- The booklet was a good information source
- The layout was fine. I really enjoyed reading all of the articles.
- I thought the booklet was well laid out and written nicely!
- Nothing it was clear and concise. Good job! If it was much longer, I'm not sure it would get read. I took restaurant management classes at LCC and I found this to condense the sanitation course into easily understandable vocabulary.
- No. But keep this kind of information coming to us.
- Very useful and informative.
- Nothing -- very well written and very informative and easy to read.
- Nothing. I thought it was great, and I think this would be a good topic for seminars or classes.
- I can't think of anything that should be changed.
- Nothing, it was very informative.
- I read through (scanned) the book its was well written, I already knew how to handle food. Questions are tricky though.
- It was quite informative -- thank you!
- didn't know much about foodborne illness and had to read that part of the book more than once to really understand it.
- Nothing -- you have done a great job in informing us about the different topics!
- Be sure all licensed day care homes had a copy!!! It is a great book -- handy reference.
- Nothing, I enjoyed it and will refer to it periodically as to keep up and refreshed to the handling and safety measures.
- Nothing! I thought the booklet was very good!
- Nothing -- excellent job!
- Well done!
- Nothing -- great "beginning" book with just enough info -- not confusing. Thank you for the booklet and including me in your survey!!
- Nothing -- I thought it was an excellent booklet.
- I thought the booklet was fine.
- Nothing. It was very good as far as reading and understanding.
- Nothing -- I think every caregiver should have one.
- I thought the booklet was very well put together. The booklet was very informative but compact. Thank you for sharing this survey with me.
- I wish I would have gotten it much sooner -- I feel it is a book that should go out to every parent as well as any old daycare or new daycares.
- Nothing! Thank you for putting so much time, thought and energy into insuring the health and well being of day care children.

- I would not change any of the booklet; its all useful.
- The booklet is just fine
- Nothing, it was well put together
- Keep up the good work!
- The booklet was done nicely but our newsletters from our food programs keep us on top of these subjects. I'll say one thing for your guys .. you certainly are persistant!
- Nothing, I thought it was very informative and I learned a few things I didn't know about.

Changes/Additions to the Booklet

- Add a section explaining whether or not an automatic dishwasher is of nay use in sterilizing dishes and utensils for those of us who use one. I do not hand wash.
- Add recipes
- Print it on recycled paper. Distribute to all parents.
- I'd rather it be a physically smaller booklet -- something to keep in a kitchen drawer.
- None maybe pictures.
- Do not repeat so much
- The gray boxes -- seems blurred! Small print is hard to read!
- Immersions sanitizing solution page 11 for dishes -- is it the same solution as on page 11. I saw the * note on page 10 but when I turned the page to find solution for dishes all I found was instructions on how but no recipe for solution.
- I would put statement of other sanitizer recipes. Statement of washing infants hands at diaper change and before feeding.
- Only that I might be a little more visual or a video be made of it to share with children and the parents of the children we care for!
- More advanced ideas -- pesticide residues on fruits and vegetables now to get these off.
- The safety ideas were helpful but sometimes it is impractical to follow all the procedures and have time to operate your daycare (sanitizing dishes, checking all food temperatures etc.) Have you ever tried to feel 6-12 children 3-4 times a day?
- Bigger!
- Expand on the use of automatic dishwasher -- do they sanitize are they safe?
- Maybe add a quicker reference about with temperature times formulas??
- Maybe put snack and meal time and field trips together -- basically the same guidelines.
- A chart of food temperatures, sanitize solutions , refrigeration temperatures and time table for storage, all the precise information that one might forget and can quickly glance at for a referral or be able to post on wall or fridge and to remind staff and/or family members!

APPENDIX I

Responses about the acceptability of the booklet by a sample of Michigan child care center teachers

Child care center teachers: Opinion about the Booklet

1. **Did you read the booklet, What You Can't See Can Hurt Your Kids and You?**

   Pretested Experimental Group
   95 **All of it**
   47 **Part of it**
   7 **None of it**

   Nonpretested Experimental Group
   34 **All of it**
   29 **Part of it**
   2 **None of it**

3. **Did you *learn anything new* after reading the booklet?**

   Pretested Experimental Group
   116 **Yes**
   22 **No**

   Nonpretested Experimental Group
   44 **Yes**
   16 **No**

   If yes, what?

Mold

- About mold on cheese
- I didn't realize some molds produce toxins. I thought it was okay to say scoop out the mold on jam or jelly for instance, and eat the remaining product.
- What and what not to preserve with moldy food. I have always assumed that a spot of mold on cheese meant to discard the entire thing!
- Info on mold
- Molds
- Bread, jams, etc. are unsafe if moldy -- can remove moldy portion and save.
- That you can cut part of molded cheese off about one inch and still use the rest.
- Moldy Food section informative

Foodborne illnesses

- Foodborne illness and unsafe foods.
- Symptoms of foodborne illness begins 6-24 hours after eating contaminated food.
- Foodborne illness.
- People can die from foodborne illness.
- What foodborne illness is and how many people get it and causes of it.
- Foodborne illness can cause death.
- Interesting facts about foodborne illness.
- The high risk of foodborne illness.
- Even with the very best prevention measures taken at my center foodborne illness is not eliminate completely.
- How common foodborne illness actually is.
- More about foodborne illness;
- What exactly Foodborne illness is what the symptoms are, and how to prevent
- I learned more about foodborne illness.
- Foodborne illness and even though I clean tables after caring for a group students I should clean again prior to snack.
- Who is most at risk.
- I knew nothing of foodborne illness.
- The number of people in US affected by foodborne illness You cannot smell bad food.
- More about foodborne illness
- I learned what foodborne illnesses and how I can do my best to prevent it.
- Foodborne illness
- I learned more about foodborne illness and what causes it. I also learned more about preventing foodborne illness.
- I learned that it is easy to get foodborne illness if not handling food safely.
- That children are at a higher risk of getting a foodborne illness
- The number of people that get foodborne illnesses

- The causes of foodborne illness.
- Foodborne information
- That 9,000 people died of foodborne illness last year. Also that mold roots could rot a whole loaf of bread.

Temperatures

- Internal temp. when using micro
- Proper food temperatures
- Various temps that foods should be to be safe
  Temperature to cook food to and temps for freezer and refrig.
- Internal temperatures
- I was more concerned with the cooking/cooked temperature for bacteria, thinking it was safe.
- pp 7. I always wanted to know how cold a refrigerator should be to keep food safe especially milk, cold cuts, etc.
- Info in the refrigerator -- temperatures and so on.
- The best temperature for your refrigerator for safe food storage
- At what temperatures meat are safely cooked.
- What types of foods that must be cooked and to what temps.
- Specific temperatures to store and cook foods at.
- Since we do not cook our own food I learned correct cooking temperatures
- Storage Temperatures.
- Temperatures (internal) for meats etc.
- Degrees to heat or keep food cold 45 or 140°F.
- Cooking temperatures
- The temperature of food is to be kept at.
- I was not aware that "hot foods" had to remain hot until served.

Sanitizing/Cleaning

- How to sanitize a surface with bleach and water.
- Immersion of one minute for sanitation.
- Don't use "lemon fresh" bleach to clean.
- Exact formula for sanitizing solution.
- How to properly sanitize
- Exact sanitizing recipes
- Never rinse off sanitary solution.
- Bleach mixture can be stored for one week -- not made each day!
- The questions of how long bleach water is good in a spray bottle -- the answer was change it each week.
- We did not wash tables before snack. We use place mats and napkins.
- Scented bleaches.

- Bleach and water solution can only be kept for one week. do not use scented bleaches for sanitizing.
- Sanitized bleach water lasts for a week (I change it daily)
- When sanitizing with bleach -- don't use scented bleach; bleach solution used for sanitizing can be used only up to one week.
- Proportions for sanitizing solution.
- Temperature to cook food to and temps for freezer and refrig.
- Everything I've ever heard said the bleach/water sanitizing solution was only good for 24 hours. Your book said "up to one week."
- Sanitizing solution can be used up to one week in spray bottle. We prepare daily.
- Sanitizing solution can be kept up to one week
- Clean condition do help!
- We will be sure to wash place mats and tables with bleach mixture.
- Addition of soapy water procedure before sanitizing -
- Do not rinse off sanitizing solution; label containers not lid.
- Bleach water solution can only be stored for one week to sanitize
- Sanitizing solution can be used for up to 1 week.
- That the sanitizing solution used for cleaning can be used only up to one week.
- P. 10 Number 3 Sanitizing Surfaces using the spray solution (We've always used a sanitizer on a cloth.)
- Bleach/water solution is effective for up to a week.
- Not new information but a good review.
- I didn't realize that you could only keep bleach/water solution only 1 week.
- Disinfectant solution could be kept for a week (I change daily)
- Clean/sanitize procedure. Sanitizing solution.
- That you shouldn't rinse the table after using bleach and water on it.
- That you can use the same sanitizing solution up to one week. I always was told to change solution every day.
- Using the proper steps to sanitize
- Sanitizing solution can be used for one week
- Questions about the use of bleach and how long it will keep
- Bleach solution can be stored for only one week in a spray bottle.
- That my sanitizing procedure wasn't correct.
- Bleach and water solution can only be kept for one week. do not use scented bleaches for sanitizing.

Leftovers

- Using leftovers within 2 days (at home!)
- Leftovers should be stored in pans 2" deep or less
- Throw away leftovers after two days.
- Throwing food out after 2 days.
- Leftovers should be kept only 2 days
- Learned to throw out leftovers more than 2 days old.
- Throwing out snacks that have been served but not eaten
- Throw out uneaten food that has been served but not eaten.
- Do not store leftover food for more than 2 days.

Storage

- Storing food -- proper food storage
- Store food safely
- About unsafe food
- How to store food
- How long you can keep cooked food
- New methods for storing and serving food.
- Proper food handling,
- The kinds of food that can be saved.
- Keep food 6 inches from floor (even in a cupboard)
- How to handle food better for safety and the statistics.
- Storage of banana's
- Freezer temps do not kill bacteria.
- Keeping food cold and keeping dishes clean and air drying.
- Storage of food
- Handling and caring for food and to safely produce food.

Reheating/Cooking

- Reheating kills the bacteria but not the toxins that contaminate food doesn't smell, look, or taste bad.
- I was unaware reheating in a crock pot was unsafe.
- Cook safely
- Thorough cooking does not destroy formed toxins.
- Cooking does not destroy toxins.
  Internal temperatures important when cooking; information on toxins.
- Thorough cooking doesn't destroy toxins.
- Cooking and reheating food issues.
- Put food into shallow pans when cooked. Pans that are 2 inches deep or less.
- Cold spots from microwave cooking.

Washing Fruits and Vegetables

Infant Feeding

- I have a new baby, and I didn't know to throw out baby food after 36 hours
- Page 16. Serve baby food from a dish, not directly from a jar. Information about baby jar food and breast milk.
- Sterilizing baby bottles (difference between sterilizing and sanitizing).
- Breast milk can be frozen.
- Breast milk bottles must be dated from the time they are pumped and not when they are brought in.
- Breast milk bottles must be dated from the time they are pumped and not when they are brought in.
- Sterilizing baby bottles and sterilizing all surfaces used in food preparation.

Field Trips

- We don't take field trips because we're flexible scheduling, but I found it interesting that centers cannot take meat or egg sandwiches or yogurt.
- Food care on field trips
- Information about field trips
- Field trip food information for hot and cold storage.
- About foods on a field trip
- Page 14 foods that child care centers may not take on field trips.
- Child care centers can't take meat sandwiches on field trips (we don't do field trips with meals) internal cooking temperatures (We don't do meals, anyway)
- I really thought the field trip on was good. I did not know some things in there.
- That a day care cannot take meat, tuna, or egg salad sandwiches on a field trip even if in a cooler

Raw Eggs

- Raw batters can be harmful
- Not to let anyone taste batter, dough made with eggs
- When cooking kids love to lick the spoons, beaters and bowl.
- That eggs need to be cooked completely.
- Never let children eat batter because of the raw eggs.raw egg information.
- Under the cookie section- Never eat cookie dough and raw eggs.
- To never let children eat cookie sough or cake batter because of raw eggs. I thought with such a small amount they would be tasting it shouldn't harm them.
- I didn't realize eggs had to be cooked until firm because of bacteria.

Indicators of Unsafe Food

- Symptoms can be flu-like.

Cross-contamination

- That you cannot transfer milk to different cartons (we let the kids pour from smaller pitchers.)
- How unsafe improper handling can be.
- About not putting milk in any other container other than the original one
- Contamination of food usually occurs from improper handling of the food after it is bought.
- That it is inadvisable for children to serve themselves from a box or basket/bowl quantity of snack

Regulations

- New regulations
- Where to get a copy of the licensing rules.
- Regulations,

Toxins

- Toxins.
- Toxins are not killed by cooking.
- Cooking does not kill toxins
- Spoilage and toxins caused by the use of "old" foods.
- Cooking doesn't destroy toxins in the food.
- That toxins are not killed with thorough cooking.
- Toxins cannot tell by looking, smell, or tasting food it toxins have formed; potential victims and numbers of.
- Information on toxins The differences between spoiled and contaminated food.
- Also, that toxins cannot be eliminated, therefore, we cannot be 100% safe if they come from the store.
- New and different ways food can become contaminated.
- Toxins can not be destroyed by thorough cooking.
- Toxins
- Heating does not kill all toxins or bacteria.
- Rapid reheating kills bacteria but not toxins.
- Cooking does not destroy toxins and you cannot detect contaminated food. (by looking, smelling, and tasting)
- That cooking does not destroy toxins leftovers -- 2 days

Thermos

- When using thermos to keep food hot you should fill the thermos with very hot water and let it sit fore about ten minutes before putting hot food in.
- Do not keep hot food in a thermos for moire than 2 hours.
- Never reheat food in crock pots or slow cookers. They take too long to heat food to safe temperatures.
- That hot food should not be in a thermos more than 2 hours

Miscellaneous

- It served as a refresher.
- I did not really "learn" anything new. A lot of it I already knew but was not fresh in my memory.
- I was reminded that both cleanliness and contamination are causes of illness.
- Not to refreeze any food;
- Foodservice workers have a great responsibility in preparing food safely
- I just completed the food handlers course in July 1994.
- Step by step methods for each topic.
- I read the book after I did the survey and felt it was very good!
- Some ways to eat safely.
- Some, read it a while ago, don't remember specifics.
- Great resource and facts
- Something from each section.
- I found the whole book very helpful.
- It was good to review rules, even to use with my own family at home.
- I have read the book before that a friend had.
- Nothing new, but good refresher.
- Great reminders
- 3 compartment sink idea
- Nothing was really new to me, but reading the booklet

4. **Put a "√" next to the topics you thought were *useful* to you?**

Pretested Experimental Group

76	**Regulations (p. 2)**	104	**Cleaning Up (p. 10-11)**
110	**Foodborne Illness (p. 3)**	97	**Snack and Meal Time (p. 12-13)**
104	**Unsafe Food (p. 4-5)**	79	**Field Trips (p. 14-15)**
94	**Storing Food (p. 6-7)**	44	**Caring for Infants/Toddlers (p. 16-17)**
69	**Cooking (p. 8-9)**		

Nonpretested Experimental Group

28	**Regulations (p. 2)**	45	**Cleaning Up (p. 10-11)**
46	**Foodborne Illness (p. 3)**	42	**Snack and Meal Time (p. 12-13)**
42	**Unsafe Food (p. 4-5)**	32	**Field Trips (p. 14-15)**
40	**Storing Food (p. 6-7)**	16	**Caring for Infants/Toddlers (p. 16-17)**
42	**Cooking (p. 8-9)**		

5. **Put a "√" next to the topics you thought were *not* useful to you?**

Pretested Experimental Group

12	**Regulations (p. 2)**	3	**Cleaning Up (p. 10-11)**
0	**Foodborne Illness (p. 3)**	2	**Snack and Meal Time (p. 12-13)**
3	**Unsafe Food (p. 4-5)**	27	**Field Trips (p. 14-15)**
7	**Storing Food (p. 6-7)**	68	**Caring for Infants/Toddlers (p. 16-17)**
22	**Cooking (p. 8-9)**		

Nonpretested Experimental Group

5	**Regulations (p. 2)**	1	**Cleaning Up (p. 10-11)**
0	**Foodborne Illness (p. 3)**	2	**Snack and Meal Time (p. 12-13)**
1	**Unsafe Food (p. 4-5)**	15	**Field Trips (p. 14-15)**
5	**Storing Food (p. 6-7)**	31	**Caring for Infants/Toddlers (p. 16-17)**
7	**Cooking (p. 8-9)**		

6. If you thought any topic was *not* useful, explain why?

Regulations

- I am already familiar with the regulation information.
- Regulations -- because it never told me anything about the illness. It only tcld me where to write to.
- Already know about DSS regulations.
- Regulations are dull to read, but it is helpful to have addresses if a future need arises.
- I'm already very familiar with regulations.
- Already have regulations info from DSS
- Regulations pertained more to my director.
- Already aware of regulations because we are licensed.
- We had a copy of these regulations and had read them.

Infants and Toddlers

- We don't care for infants/toddlers on a regular basis.
- We do not have infants in our class.
- Do not care for infants/toddlers (can use info for home life though)
- I do not care for this age group.
- I don't care for infants/toddlers
- I don't work with babies
- Minimum age is 3 so we don't have infants/toddlers.
- I don't have infants/toddlers in the program.
- We do not have infants/toddlers.
- We do not service infants.
- I do not care for infants/toddlers
- Caring for infants/toddlers does not apply to the center all information was useful for personal knowledge.
- All the children at the center are four years old
- I don't work with infants/toddlers and I don't cook often for the children.
- I teach preschool so the caring for infants and toddler section is of no use to me professionally but I still found it useful personally.
- Informative but not the age group I work with.
- We do not care for infants at our center.
- Infants/toddlers -- not applicable to our center
- I simply do not work with infants/toddlers
- I do not care for infants/toddlers
- Our preschool limits children between the ages of 3 and 5.
- Checked infants/toddlers because we don't care for this age.
- We don't care for infants/toddlers
- We do not service infants and toddlers.

- Interesting -- but I don't care for infants/toddlers.
- Don't care for infants/toddlers
- We don't care for infants and toddlers.
- We do not at this time care for infants in our daycare
- Do not have infants/toddlers in the program.
- My program doesn't work with infants or toddlers
- Does not pertain to my age group.
- I do not care for infants/toddlers
- Caring for infants/toddlers does not occur in my school setting but very useful for myself at home as I have a 3 year and 7.5 month old.
- We do not care for infants/toddlers.
- Our center at present does not care for this age group
- We don't work with infants/toddlers.
- It was insightful (Caring for infants/toddlers) but does not directly apply to my children
- We do not care for infants or toddlers
- Caring for infants/toddlers wasn't useful because we are a preschool and all are potty trained.
- Infants are not in this center.
- At the center where I work we don't care for toddlers. It was good to review and keep in mind through.
- Caring for infants/toddlers because we don't care for infants and we only have certain kids that do certain things like toddlers. We don't care for toddlers.
- Infants/toddlers -- only K-5
- Infants/toddlers
- Infants--because we do not deal with infants at preschool.
- We do not care for infants/toddlers at our center
- Do not care for infants/toddlers
  we do not care for infants/toddlers
- I don't care for infants/toddlers .
- We don't have infants. However if we did it would have been helpful.
- We have 2.5 - 6 year olds in our program
- I do not cook the food at my center and
  I only serve 3 to 5 year olds.
  No infants or toddlers in my program.
- We do not care for infants/toddlers.
- We don't have infants/toddlers at our center but the information was important.
- I do not care for infants/toddlers
- Caring for infants/toddlers -- our Head Start center enrolls 3 and 4 years olds which eliminates formula and diaper duties -- your section on this is real informative though.
- We don't care for infants/toddlers
- We don't have toddlers or infants.
- We do not care for infants/toddlers
- We don't care for infants and toddlers.

- We don't have infant or toddler program.

Field Trips

- We do not go on field trips; we do not care for infants or toddlers.
- Our child care does not take field trips.
- Don't take food on field trips.
- We can't take food on field trips
- We do not go on field trips
- Field trips -- don't serve food on them.
- Food is not served on our field trips
- We don't have field trips in our school.
- We just weren't involved with field trips
- Field trips do not apply to our preschool situation.
- Do not eat on field trips
- I am not involved with field trips
- When my groups take field trips lunch is never needed.
- Our toddlers do not go on field trips
- Never take food on field trips
- We do not go field trips.
- We rarely take field trips
- We don't do field trips

Cooking

- We normally don't do cooking (once in a while in a class project. We have a parent bring snack.
- Cooking -- our meals are brought in hot carriers which are temperature controlled.
- We do not cook or prepare meals at preschool.
- We don't cook the food or store the food -- the cook does we just serve it them throw it away when finished
- Cooking -- we don't cook, use pre-cooked.
- We don't cook in our program
- We do not serve meals, only snacks
- We don't cook very often
- Cooking because we don't cook at our child care center.
- We don't cook or store food.
- We do not cook.
- Didn't apply to our center -- children bring food from home.
- The cooking wasn't useful because we don't cook meats. We usually limit our cooking to soup and baking.
- We do not cook or store cooked foods at the preschool.
- I am a preschool director only. We don't serve food besides snacks

- I don't cook for the children except to warm their lunch.
- We are a preschool and do very minimal food preparation
- We only serve prepackaged snacks and individual servings of milk.
- We do no cooking
- We use packaged snacks.

Miscellaneous

- I enjoyed all sections
- It is always nice to read info like this even if it just reminds you of things.
- These topics are always useful. It's amazing how much some of us do not know.
- I liked the booklet.
- Unsafe food issues are basically self-explanatory.
- Everything was useful.
- Some topics did not relate to the needs of my program or concern my handling of food.
- Our program is strict on cleaning up -- using 3 step method, sanitizing food areas, and washing hands.
- Some were review.
- They were all useful and helpful. Some were more for the areas I work in.
- Cleaning up -- I have had many inservice trainings on clean-up. But is a good review.
- Not needed in our program
- Not that they weren't useful --cleaning up and snack and meal time -- but I feel I was already knowledgeable about these topics
- They all had some info that's good to review.
- We are aware of these topics as we are a licensed preschool within a school district
- Most of the info under unsafe food were things I already knew -- common sense!
- Program is 2.5 hours.
- They were all very useful topics, I plan to leave booklet out in office for all staff to read.

7. Did you like the layout of the booklet?

Pretested Experimental Group

139	**Yes**
0	**No**

Nonpretested Experimental Group

59	**Yes**
1	**No**

If no why?

- O.K.
- It was easy reading and will be useful to refer to (easy to find the topic that I need)
- Darkened background with writing is hard to read.

8. What did you like best about the booklet?

Reading

- It was easy to read and very informative -- quick reading
- Easy to read; seemed organized
- Easy to read, to the point
- Easy to read
- It was easy to follow.
- Straightforward and easy to read
- Everything was good
- Easy to understand and find info.
- Not too long!
- Easy to read and informative
- It gave good information in easy and fast to read format.
- Topics, simple reading, highlighted areas
- Easy to understand and repeats of sanitizing
- That it is easy to read.
- Very easy to read. Information is accessible will be able to find particular subject quickly.
- Easy and quick to read yet informative
- Easy to read, it was also laid out well with little problem finding subjects.
- Clear and concise!
- It's easy to read and the shading effects are most effective. When I read materials such as this I try to read it with the parents that we serve in mind. This pamphlet would be excellent for our "clients."
- Easy to read and clear
- Information was presented in a very simple manner.
- Brief
- Very informative, clear, and easy reading.
- Easy to read
- It is simple to read and easy to understand
- Each section was clear and concise
- Easy to read and understand.
- The fact that it was very direct. I didn't need to read 2 or 3 pages to find out a couple important things.

- Neat, clear, readable, easy to understand and follow.
- It was easy to read and informative
- I liked how it explained every detail that is wanted to get across (It got to the point!)
- Easy to read, presented well
- Easy to read. Each section is labeled nicely. Each section is easy to find.
- It's easy to read.
- Easy to read -- clear and will use if for staff training
- It was short; concise and to the point.
- Easy to read and understand.
- Informative and easy to understand.
- Simple and fast reading.
- It was easy to follow.
- Clarity -- ease of finding appropriate topic
- It had complete description and easy to read and follow, important information was repeated with clear directions.
- Quick able to read format.
- Easy to read
- Simple, easy to read and understand.
- Got to the point. Easy to read.
- It was simple and to the point. Most of the things I knew.
- Information was easy to locate.
- Easy access to information. Clearly stated information.
- Simple -- easy to read in short time.
- Simple and short, everyday language, pertains to group care situations.
- It is clear and well organized.
- Easy to read; not a lot of extraneous material.
- It was arranged in a reader friendly fashion -- easy to look up referrals -- to the point right on target.
- User friendly
- Easy type for reading
- Easy reading and fast reading
- It was very direct and easy to read.
- The booklet is clear and thorough.
- Simple easy to read.
- All the information was easy to follow and understand.
- The wording of the material was understandable. The information was enlightening and helpful.
- The simplicity, repetition for emphasis and important inform highlights in the "boxes."
- Large bold easy to read print.
- It explained everything simply and got right to the point.
- Short and easy to read. Reinforced certain points.
- Easy to read -- short and to the point good tool for training -- highlighted areas are useful for quick reference

- Short easy to read and the most important thing in the book are highlighted.
- Easy to read and understand, compact and concise
- Large print, clear language, easy to find headings.
- Easy to understand and repetition of sanitizing methods.
- Easy to read and understand
- Useful facts presented in an understandable manner. Great
- Easy to read and clearly outlined
- Very informative and easy to read.
- Easy-to-read format; practical, useful information.
- Info was set up so it was easy to read quickly.
- It is very easy to read and also to go back and refer to
- Clarity and clean lay out; makes for easy reference. Also, produces excellent handouts for staff.
- Quick, easy reading. Well-organized
- Easy to find topics, applicable to our situation.
- Helpful informative neatly organized.
- Special instructions were highlighted easy to read
- It was written in an easy to read manner -- nothing that wold be hard for the general public to digest.
- It was easy to read and understand.
- Simple and to the point. Nice size letters (print)
- Easy to read, informational.
- It was done in a very informative and easy to read manner.
- Clear/concise, nicely laid out.
- Easy to read, with my busy schedule, I appreciate preciseness.

Format

- Large print -- excellent format
- Good layout
- Highlighted items of importance.
- The important points were printed in an "outstanding" way. Bold print off to the side, large print.
- Nice presentation
- The print was also large enough for all people to read.
- The large printing was easily to read. The bold type headings.
- I liked the complete layout -- it was put together very orderly.
- Print.
- Large print, brief but thorough info for each topic.'
- I liked the headings and subtitles in bold print and the information printed for easy reading.
- Different types sets -- highlight boxes; clear headings
- Headings made topics easy to find.
- Short and to the pint!

- Topic title at top of page.
- New-styled layout.
- Small pamphlet type
- The way it was set-up (categorized) made it easy to read.
- Large print for topics -- easy reading.
  I liked the highlighted footers at each page
- Large print! Shaded info boxes
- The bold print of the categories. Also the print is large and makes for fast reading.
- Words were in big letters and very clear
- Very nice layout compartmentalizing facts
- The layout was super; the captions were large and the print favorable. It was very informative. It would be super for persons just starting a day care center.
- The organization and headings, titles, and subheadings also the examples used.
- Headlines, large print, darkened areas to highlight.
- Shaded areas -- too quickly get useful information.
- Organized topics.
- Topic layout -- If you have a specific concern you don't have read entire booklet or flip through.
- Large print, easy to read -- basic straight forward procedures. It is also grouped and labeled for easy "look ups."
- Bold type, large print easy to read.
- Each topic is presented on one page. This will be helpful when presented as discussion topic in our high school learning lab.

Information

- All of the food tips
- The info on clean up and infant/toddler feeding
- Good information
- I especially liked the section on field trips and cleaning up. We'll probably make copies of the field trip section for parents. And post the cleaning sections around the center.
- Good guidelines for reference.
- Learning what was harmful in child care
- The cooking and reheating temperatures.
- The information on foodborne illness.
- Keep you updated of material
- I found all of the information useful; it will be a great refresher for staff to look at.
- The different topics
- I liked the field trips section the best.
- Foodborne illness and cleaning up
- It was very informational
- Very informative -- gave all basic rules
- Snack and Meal time, cleaning up makes sense it reinforces the importance of not

being in a hurry.
- It was informative
- It explained a lot about foodborne sickness and how to keep food safe.
- The topics shared about food and how I can better serve our food etc.
- Very useful information.
- Very informative
- Provides needed info
- Good information
- It was very informative, like a refresher course
- Informative
- Unsafe foods -- and foodborne illness also food storage.
- Explaining the need for clean hands and surfaces as well as utensils.
- How informative it is.
- All of the information and addresses of further resources.
- The foodborne illness
- It's helpful contents
- The new information I learned about and the old information that I relearned
- It has great information.

Miscellaneous

- It had complete description and easy to read and follow, important information was repeated with clear directions.
- Great idea -- I've been requesting this type of info for ages. nothing provided by DSS or Environmental Health Agency to the best of my knowledge
- We would like a copy for all our staff to keep in each classroom (7 copies)
- It was just a refresher information book for me to read.
- All of it.
- The fact that it exists and can be used to train all staff members.
- This book was an enlightenment about handling food safely.
- The things in your booklet were things I was aware of but reading it reminded me to be more careful.
- That it was developed and distributed with the opportunity for feedback.
- Very thorough.
- A good booklet to share with parents
- I liked the first survey and then receiving the booklet to read and then doing the second survey.

9. Was the booklet easy to read?

Pretested Experimental Group
137 Yes
0 No

Nonpretested Experimental Group
60 Yes
0 No

10. If you answered *no* to question 9, put a "√" next to the topics you thought were *not* easy to read?

Pretested Experimental Group

0	**Regulations (p. 2)**	0	**Cleaning Up (p. 10-11)**
0	**Foodborne Illness (p. 3)**	0	**Snack and Meal Time (p. 12-13)**
0	**Unsafe Food (p. 4-5)**	0	**Field Trips (p. 14-15)**
0	**Storing Food (p. 6-7)**	0	**Caring for Infants/Toddlers (p. 16-17)**
0	**Cooking (p. 8-9)**		

Group C

0	**Regulations (p. 2)**	0	**Cleaning Up (p. 10-11)**
0	**Foodborne Illness (p. 3)**	0	**Snack and Meal Time (p. 12-13)**
0	**Unsafe Food (p. 4-5)**	0	**Field Trips (p. 14-15)**
0	**Storing Food (p. 6-7)**	0	**Caring for Infants/Toddlers (p. 16-17)**
0	**Cooking (p. 8-9)**		

11. If you could, what would you change about the booklet?

Negative statements

- The repetitiveness on sanitizing surfaces and immersion sanitizing -- it is in the booklet 4 times where you could have just said refer back to page ...
- In caring for infants -- we found it best not to store ANY food for parents. We require them to clean out all food nightly and send in fresh the next day. We also discard any unused portions of milk and do not make up any formula.

- Much of the information in this booklet is not relevant for 2.5 hour programs that only serve a snack.
- After reading this booklet it feels as if one should live in an isolated bubble!

Positive statements

- It was quite informative.
- Great job!
- Make it available to all centers!
- Not a thing. I like the layout of the book, the print. It was simple, easy to read and understand.
- I think the booklet was put together very well.
- It was fine. I think you should also include safety procedures for using the sanitizing around children. Especially where eating takes place in a classroom setting. What kinds of sanitizers are safe to use around children especially when they will be present during the pre and post cleaning of eating table areas.
- Nothing I think it was very informative
- I think the booklet is very useful as is.
- I liked it. Thanks!
- It was very good!
- I wouldn't explain the regulations page as much as you did. Otherwise, it's perfect. To the point, easy to read, and not too thick!! Good job!
- I've been doing latch key same building for 7 years now 1st time received any of this information. Thank you! All these ideas are great and sensible so why are schools not made to sanitize their table prior to use? let alone teachers taking time for children to wash hands prior to snack and lunch.
- Very nice job.
- Nothing would like copies for all our staff to read and keep to refer to.
- Thanks!
- Nothing, everything was great
- I liked it just the way it is. Excellent book to have on hand, especially in the kitchen.
- It doesn't need change as it is well written.
- Nothing it was very informative. I knew most of it. It is good to have a booklet on hand to reinforce this knowledge. Thanks
- I wouldn't change anything; excellent preventative package
- Nothing at all.
- Nothing -- it's very good just as it is.
- It's well done.
- Nice job
- I thought the book said a lot.
- This booklet looks very professional and was laid out in a clear and useful manner -- congratulations!
- It makes a nice reference to keep in the room.
- Nothing I am considering making copies of some pages to post at the foodservice area to constantly review and refer to when needed. Parent volunteers can read this also, and learn from for home safety use.
- It was excellent.
- Good format -- easy reading

- Very informative -- thank you.
- Nothing. It was very thorough and informative.
- Nothing -- great booklet very informative!

Changes/Additions

- I think it would be interesting to put a "quiz" at the beginning to see how much I might know before reading sometimes this sparks people's interest to find out more!
- Include health department regulations instead of asking us to write for them.
- The binding is too tight for quick reference. Also tabs for topics would make reference much easier.
- I would like a sample of appropriate snacks for preschool. How many servings? How much in each serving? etc.
- Pictures or diagrams -- examples include food containers that should be used.
- Use smaller font and some pictures
- I would add the fact that perishable foods that have been opened should be labeled with the date they were opened.
- I would have liked to seen a section on how to treat a child with foodborne illness, plus a section to give tips to parents.
- Add color, focus more on a "prime-time" type program; after school, K-thru 5, dry food and juice.
- Need to check information regarding the length of time bleach water can stay in bottle. OSHEA regulations require us to mix new bleach water every 24 hours.
- Recipes for simple snacks might be helpful.
- Include dietitians input.
- Pictures (just kidding!)
- I understand that bleach water should be prepared fresh daily not weekly as stated which is correct?
- Grayed areas could be lighter for easier reading
  Could red ink be used in some of your shaded areas
- The shaded areas were hard on the eyes
- I would add a page that could be duplicated that had test questions -- so it could be used with staff and staff training.
- I would make smaller booklet for all who work for child care.

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