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ALTERATIONS IN BODY COMPOSITION, ANTHROPOMETRIC MEASUREMENTS, AND DIET OF HIGH-ABILITY FEMALE COLLEGIATE DANCERS

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ABSTRACT

ALTERATIONS IN BODY COMPOSITION, ANTHROPOMETRIC MEASUREMENTS, AND DIET OF HIGH-ABILITY FEMALE COLLEGIATE DANCERS

BY

Brandy J. Narcy

The purpose of the study was to observe alterations in body composition, anthropometric measurements, and diet in a group of female college repertory dancers. Six dancers and six non-dancers served as available subjects in the study.

The dancers were expected to decrease their percentage of body fat, girth and skinfold measurements, and caloric intake after 14 weeks of training. They also were expected to increase their caloric expenditure.

The tests used included Activity and Food Frequency Questionnaires, anthropometric measurements, and hydrostatic weighing. The subjects were tested prior to rehearsals and were retested immediately following a dance production.

The dancers compared favorably to college and professional dancers from previous studies.

Suggested research on college dancers includes ongoing studies of repertory dancers, further investigations on training effects, extensive dietary evaluations, and correcting the absence of research on male dancers.

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CHAPTER 1

INTRODUCTION

The arts and sciences have long been dichotomies in educational and professional institutions. In particular, the art of dance and the science of physiological research are rarely, if ever, approached simultaneously.

> "Considering America's obsession with health and fitness, it seems paradoxical that dancers - who, of all people, have such a sharply developed inherent 'feel' for the control and limitations of their bodies and are so dependent on sound health - often have only a vague, if not completely ignorant, conception of their bodily workings (1)."

Recently, scientists have begun to enter the world of dance. Dancers themselves have become an operative force initiating research in dance. By working together towards a common goal, dancers are realizing their strengths and weaknesses, and scientists are discovering that dance presents a viable and significant area for physiological research.

The Problem

Female dancers, as a group, are greatly concerned about how their bodies look. Dancers are often judged on bodily appearance as well as technique and performance quality for specific dance roles. This concern may lead to eating disorders which, when added to the dancer's extensive physical training, can result in health problems. Some of these health problems have been documented as

anorexia nervosa (2, 3), bulimia (4, 5), low caloric intake (6), and poor eating habits (7). These conditions can further lead to weak and/or injury-prone dancers (8). When dancers and their mentors are able to diagnose and understand these problems, appropriate steps can be taken to diminish their severity.

Need for the Study

Repertory dancers at the college level, opposed to professional dancers, are faced with limitations of the educational institution. Financial obstacles and lack of facilities go hand in hand at institutions which place the arts last on their priority list.

The most notable limitation in an educational atmosphere, in relation to this investigation, is the occurrence of a large turnover of dancers. Individual dancers have an average of only four years to gain experience and 'make their mark' in a University company. This situation can increase competition for dance roles and may magnify the problems discussed earlier.

Many college athletic teams participate in seasonal assessments of percentage of body fat. Similar assessments of body composition with concurrent records of anthropometric measurements and a determination of dietary habits would benefit a University dance company. By measuring these variables and their changes before, during, and after dance season, the trends of a company could be discovered and individual changes monitored. Healthy

dietary programs would be easier to establish when a dancer's physiological status is known.

Purpose Of The Study

The purpose of this study was to observe alterations in body composition and nutritional habits of high-ability female dancers during the Michigan State University Repertory Dance Company's 1986-87 season. This included measuring body composition, collecting anthropometric data, and estimating the daily average caloric intake and expenditure before and during the dancer's season. The data obtained from the dancers were analyzed and compared with the data from a control group of six non-dancers. The dancers' on-season measurements were compared with those obtained on dancers in other studies.

Research Hypotheses

The hypotheses tested in this study are:

1. The experimental subjects (dancers) will show a significant decrease in their percentage of body fat from off-season to on-season.
2. The dancers will have a significantly greater change in percentage of body fat, than will a group of non-dancers, from off-season to on-season.
3. The dancers will have significantly larger differences in girth and skinfold anthropometric measurements, than will a group of non-dancers, from off-season to on-season.

4. The dancers will show a significant decrease in caloric intake from off-season to on-season.
5. The dancers will show a significant increase in caloric expenditure from off-season to on-season.

Research Plan

The sample size was determined by the availability of high-ability female dancers within the population of the Michigan State University Repertory Dance Company during its 1986-87 season. The study contained six dancers. The dancers were designated as the experimental group. Their treatment consisted of the dance classes and rehearsals required of members in the company. A control group of six volunteer non-dancers participated in the testing procedures with no treatment given.

Both groups participated in before-season and during-season testing. These tests included anthropometric measurements, hydrostatic weighing, and Activity and Food Frequency Questionnaires. The subjects also kept an Activity Journal for the 14-week duration of the study.

Assumptions

The following assumptions were necessary for the conduct of the research plan and the conclusions drawn from the results of this study.

1. It was assumed that the experimental subjects were high-ability dancers. This assumption was based on their status in the company, the number of

pieces (dances) in which they were participating, as well as the demands of those pieces.

2. It was assumed that all subjects were honest and consistent when completing any journals and/or questionnaires.
3. It was assumed that all subjects averaged 8 hours of sleep per 24 hours for the calculation concerning energy expenditure.

Limitations

The following difficulties and limitations were inherent in this study.

1. There was an inability to obtain a sample of adequate size that was representative of a meaningful population.
2. Generalizations drawn from the results of this study are limited to high-ability female dancers similar to those used as subjects from the Michigan State University Repertory Dance Company during the 1986-87 season.
3. The accuracy of the information obtained from subjective forms of data collection (i.e., journals and questionnaires) is limited to the honesty and objectivity of the subjects.

Significance

Consistent use of observational techniques to describe a population of dancers and their physical and physiological aspects may eventually lead to a range of 'norm'

values for that population. This is greatly needed in dance. Not only will it bring dancers a level of knowledge equal to most athletic teams, but it may be possible to discover or prevent health problems and physical injuries before they develop.

Definitions

Anthropometry - The science which deals with measurements of the human body including heights, breadths, lengths, widths, girths, weights, and skinfolds.

Barre - A dancer's barre exercise is usually performed at the beginning of class. The dancers use a bar made of wood or fiberglass to help maintain balance when needed.

Center Floor - A dancer's center floor exercise is usually performed towards the end of class. It may consist of adagio (slow) and allegro (fast) combinations.

Hydrostatic Weighing - A method of estimating body density, percentage of fat and percentage of lean body mass by weighing the subject underwater, measuring lung volume, and estimating gas in the intestinal tract.

Labanotation - A form of dance notation developed by Rudolf Laban. It is used to record and preserve dance movements and choreographic works.

CHAPTER II

REVIEW OF LITERATURE

Numerous studies have been done involving anthropometric measurements, hydrostatic weighing, and body composition of men and women. (9-19) Evaluations concerning energy intake, expenditure, and diet in general (20-22) also have become commonplace as society becomes more aware of health and fitness. During the past few decades, women have become a focus of research. It generally is agreed that the average woman is shorter, physically weaker in the upper body, and has a greater percentage of fat than her male counterpart.

In particular, athletes have been studied due to their intensive training regimes and selective eating habits. Women athletes have moderate to low percentages of fat depending on their sport. Swimmers (23) and Volleyball players (24) tend to have more fat than gymnasts (25) and marathon runners (26).

Studies of the diet and body composition of women have involved college students (27, 28), the obese (29) and athletes (30) as well as other groups concerned about their energy requirements for various activities.

Dancers

There is a population segment of technically proficient women which has been neglected in anthropometric and

physiological research until lately. Only in the last decade have dancers been studied by research scientists and educators. However, recently an increasing number of studies have been undertaken to assess the body composition and diet of dancers. Descriptive research now is available on college and professional dancers. These studies include research on anorexia nervosa, bulimia (31) and menstrual abnormalities (32).

Diet

Nutritional factors also have been approached by some scientists. Calabrese and Kirkendall (33) estimate the professional ballerina's mean caloric intake to be 1358 kcal per day. They also discovered a significant amount of food faddism within this group. Peterson (34) discusses case reports of professional dancers succumbing to bazaar diet strategies and suggests a healthy professional dancer should consume approximately 2,000 kcal per day. Later she compared the dietary habits of dancers with those of athletes. Her study suggests that dancers exhibit poor dietary habits and low caloric consumption.

(BODY WEIGHT lb.) X (15) + (200 kcal/DANCE CLASS/DAY) (35)

e.g. (110) X (15) + (400 kcal) = 2,050 kcal/day

These observations coincide with those of Cohen, Potosnak, Frank, and Baker (36) who suggest 2,000 through 2,200 kcal per day for women. They studied 22 professional male and female dancers. Daily caloric intake for women was estimated at 1,673 kcal, with 50% carbohydrate

consumption. Mostardi (37) reported an average of 1,200 kcal per day for female ballet dancers.

There also has been some cardiopulmonary and cardiorespiratory research on dancers. (38-43). Cohen, Segal, Witrol, and McArdle (44) used fifteen dancers as subjects from the American Ballet Theatre and estimated caloric expenditures from VO_2 measurements. For women: 0.08 kcal per min per kg of body weight during barre work and 0.10 kcal per min per kg of body weight during center floor exercises. Men averaged slightly higher caloric expenditures.

Anthropometry and Body Composition

Due to the demand for linearity and leanness in the dance world (45), many dancers, females in particular, are on a "relentless pursuit of thinness" (46). This concern for thinness has lead to several studies involving anthropometric measurements and body composition of female college dancers. The results are somewhat inconsistent. Evans, Tiburzi, and Norton (47) studied 15 dance majors and found a mean of 22.4% body fat using hydrostatic weighing. Novak, Magill, and Schuette (48) estimated 20.5% using the Sloan-Weir (49) formula for obtaining body fat from anthropometric measurements. Chambers (50) used the hydrostatic weighing technique of Consolazio (51) on 5 dancers and reported a mean of 12.7% body fat. Dolgner, Spasoff, and St. John (52) studied college as well as professional dancers and used Wilmore and Behnke's (53)

formula to estimate a mean of 22.1% body fat from anthropometric measurements. Micheli, Gillespie, and Walaszek (54) found professional ballerinas to have 15.3% body fat using the formula of Sinning (55) which was designed for female gymnasts. Calabrese et al. (56) showed pre-season body fat to be 16.9% for professional dancers. Cohen et al. (57) reported 12.8% body fat for twelve ballerinas using the regression equations from Jackson, Pollack, and Ward (58).

Training Effects

Research concerning the effects of training on body composition in athletes and laymen are prevalent (59-65). However, only a few studies exist at this time relating the effects of training on body composition of dancers. Lavoie and Lebe-Neron (66) studied six professional and eight recreational female jazz dancers. The professionals had 15.5% body fat and the recreational dancers 21.4% using Zwiren's (67) modification of Allen's (68) formula. The recreational dancers decreased to 20.4% body fat after twice weekly dance sessions lasting eight weeks. Kirkendall and Calabrese, using hydrostatic weighing techniques (69) reported a group of professional dancer's off-season body fat to be 13.4% and their peak season body fat to be 13.8%.

Summary

A female dancer should consume approximately 2,000 kcal per day to be a healthy, performing , and hopefully injury-

free dancer. Dancers are reported to consume 1,200 through 1,673 kcal per day, well below the recommended amount.

Standard, universally accepted values of ideal weight and ideal percentage of body fat for a dancer have yet to be determined. Their physical appearance is subject to the opinions of their instructors, directors, and dance masters -- not to mention their often ill-perceived body self-image (70). The body weight, percentage of body fat, and lean body mass of dancers have all been found to be lower than corresponding values for non-dancers (71). Percentage of body fat has been reported with a relatively large range from 12.7% through 22.4%. Except from the lowest percentage of fat reported, college dancers averaged above 20% where as the professional dancers averaged below 17%.

CHAPTER III

METHODOLOGY

The experimental subjects were observed for seasonal changes in girth and skinfold measurements, percentage of body fat, body weight, and diet. The majority of the dependent variables were expected to decrease for the dancers and to stay the same for the non-dancers. Data were obtained via questionnaires, journals, anthropometric measurements, and hydrostatic weighing.

Sample

Six high-ability female dancers from the Michigan State University Repertory Dance Company participated in the study. These experimental subjects ranged from sophomores to seniors and were 19 through 22 years of age at the start of the dance season. All subjects were returning members of the Company except for one transfer student with previous dance experience at another school. Six control subjects also participated in the study. They were selected on a volunteer basis and were students at Michigan State University who were similar in body build to the dancers.

Out of 16 female dancers in the Repertory Company, and 8 returning members, 6 dancers participated in this study. All subjects performed two to four pieces in their annual dance concert. This concert marked their peak performance

period and the end of the study. The "treatment" conducted on the experimental subjects consisted of their dance classes and rehearsals as members of the Michigan State University Repertory Dance Company.

All twelve subjects signed an informed consent form (Appendix A) which explained the conditions under which the subjects participated in this study and guaranteed confidentiality of data. Approval of the study was received from the University Committee For Research Involving Human Subjects.

Sample size was determined by the number of high-ability female dancers available. Statistical significance was set at the .05 level for all analyses. The relatively small samples prohibited the establishment of a maximum allowable type II error; and, unfortunately, statistical power was reduced to a substantially low level.

Research Design

The study used a quasi-experimental design and had an available sample from two selected populations (female college dancers and female college non-dancers). Pretests and posttests were obtained on both groups. The dancers participated in dance classes and rehearsals. Standard t-tests were conducted on all variables to test the research hypotheses.

Variables

Anthropometric measurements, percentage of body fat (determined by hydrostatic weighing, Durnin, and Sloan-Weir

regression equations), caloric intake and expenditure, and percentages of protein, carboyhydrate, fat, and alcohol present in the diet served as dependent variables. T-tests were used within groups to analyze off-season and on-season changes as well as to evaluate differences between groups.

Extraneous Factors

Extraneous factors present in this study include the following:

1. A few subjects, due to scheduling difficulties, needed to be tested on different days or at different times of the day. This should have had a minimal effect, if any, on the data obtained.
2. The study took place during a seasonal temperature change (Fall to Winter). This may have affected opportunities and/or desires for caloric intake and expenditure.

Methods

Measuring the energy balance of individuals may be done in several ways. One of the most popular methods is to have subjects keep journals in which they record their activity and diet (72). This method is an inexpensive, essentially simple means to gain information concerning caloric intake and expenditure. Problems inherent in this type of data collection are the lack of subject knowledge for identifying amount of food portions and for judging the intensity of activity. These problems are magnified when the length of the study extends for a long period of time.

Measuring and weighing food can become a tedious responsibility as can recording all activities day and night. Subjects often begin to neglect daily recording and try to 'remember' and fill in values at a later date. Some subjects begin to habitually eat the same foods in the same portions in order to make the recording process easier. This practice destroys their normal dietary variety. Due to these difficulties, another method has been introduced (73). The Frequency Questionnaire requires subjects to complete an extensive questionnaire covering what types of food are eaten and what activities are performed and how often. In 1984, Mullen, Krantzler, Grivette, Shutz, and Meiselman (74) showed the questionnaire to be an effective means for estimating the average daily intake of calories for groups of individuals.

The Frequency Questionnaire was used in this study for data collection regarding diet and activity. A journal also was used for collecting data concerning activity.

Test Procedures

The data were collected in the Center for the Study of Human Performance at Michigan State University. The ballet class for the experimental subjects took place in Studio 34 at the Intramural Sports Circle Building on the University's campus.

The dancers were scheduled to be tested on the day rehearsals began for their annual dance concert prior to their first rehearsal. The control subjects were scheduled

to be tested two weeks later. The dancers were scheduled again on the day following their final performance in the annual dance concert. This was considered the peak of their season. The controls again were scheduled two weeks later.

Due to time commitments and scheduling difficulties, two experimental subjects were tested one week later than scheduled both before and after the dance season. Two control subjects were tested one and one-half weeks later than scheduled both before and after the study.

Michigan State University Repertory Dance Company has a widely varied rehearsal schedule. Rehearsal time and intensity are dependent upon the number of pieces a dancer participates in, the length of the pieces, the idiom and style inherent in a particular dance, and the complexity of the movements and movement patterns within each choreographic work.

Each dancer was asked to keep an Activity Journal and to record on a weekly basis the amount of time spent rehearsing and participating in dance classes as well as the intensity of the dancing (High, Moderate, Low).

To narrow the margin of subjectivity applied to decisions of intensity, an hour ballet class was given prior to the onset of the season in which the barre was defined as moderate intensity and center floor as high intensity. Any dancing below moderate was classified to be low intensity.

The ballet class was first taught at American Ballet Theatre in 1982 during a study by Cohen et al. (75) to determine a dancers' energy expenditure. The ballet class was recorded to document the specific steps used and the time elapsed for each exercise (Appendix B). Professor Dixie Durr, Dance Coordinator in the Department of Theatre at Michigan State University, reconstructed and taught the ballet class to the six experimental subjects (Appendix C). All exercises were conducted for time periods that were within two and one-half minutes of those used in the initial class. This slight time variation was due to ambiguous phrases and lack of specificity in the initial recording. It is suggested for future studies a form of notation be used, such as Labanotation, to ensure proper duplication of the class.

Daily caloric expenditure due to dancing was estimated for the experimental subjects by keeping daily Activity Journals. The Journals included dance classes and rehearsals with their respective intensities. Each subject also recorded any physically exerting activity on a daily basis in her Activity Journal. For example: walking, cycling, swimming, heavy cleaning, etc. A sample of the Activity Journal can be found in Appendix D.

In addition to the daily journal, all subjects completed two identical Activity Frequency Questionnaires (Appendix E). The first was completed in October 1986, just prior to the beginning of the dance season. The subjects were instructed to indicate their activity frequency

over the previous 14 weeks which included some summer activities. The second questionnaire was completed at the end of the 14-week dance season. The subjects were instructed to indicate their activity frequency during the 14 weeks of the study.

Daily caloric intake for all subjects was estimated from the Food Frequency Questionnaire (Appendix F). The instructions were similar to those given for the Activity Frequency Questionnaire. The subjects were instructed to indicate their food frequency with regards to the previous 14 weeks before the dance season and again during the dance season. The questionnaire was used and validated by Mullen et al. (76) in 1984.

Forty-three anthropometric measurements were used (see Table 1). The measurements were taken just prior to the onset of the dance season. Twenty-four measurements were repeated at the end of the season. Skeletal measurements of heights, breadths, widths and lengths were not repeated as all subjects had completed their growth.

All anthropometric measurements were taken by Dr. John Haubenstricker, Professor and Coordinator of the Motor Performance Study at Michigan State University. The measurements were taken in one session. A Lange skinfold caliper was used for skinfold measurements; a bow caliper and short anthropometer were used for breadths, widths, and lengths; a long anthropometer was used for heights; and a steel tape was used for girths. The equipment was calibrated prior to testing. All measurements are defined

within the protocols established for use in the Center for the Study of Human Performance at Michigan State University. The subjects were measured in shorts and T-shirts. The variety of shorts worn may have effected the hip girth measurement, as some of the shorts were made of thinner material than others.

TABLE 1 - Anthropometric Measurements

HEIGHTS
- Standing Height
- Trochanteric Height
- Sitting Height

BREADTHS
- Biacromial Breadth
- Biiliac Breadth
- Bitrochanteric Breadth
- Chest Breadth at Maximum Inspiration
- Chest Breadth at Maximum Expiration

LENGTHS
- Brachium Length
- Forearm Length
- Foot Length
- Thigh Plus Leg Length
- Upper Extremity Length
- Leg Length

WIDTHS
- Humerus Width
- Wrist Width
- Femur Width
- Knee Width
- Ankle Width

GIRTHS
- Neck Girth
- Shoulder Girth
- Abdominal Girth - 1
- Abdominal Girth - 2
- Hip Girth
- Thigh Girth
- Knee Girth
- Calf Girth
- Ankle Girth
- Deltoid Girth
- Biceps Girth (Elbow Extended)
- Biceps Girth (Elbow Flexed)
- Forearm Girth
- Wrist Girth

SKINFOLDS
- Subscapular Skinfold
- Triceps Skinfold
- Biceps Skinfold
- Chest Skinfold
- Midauxiliary Skinfold
- Suprailiac Skinfold
- Abdominal Skinfold
- Thigh Skinfold
- Knee Skinfold
- Calf Skinfold.

For measurements of body composition, all subjects wore a light-weight one-piece bathing suit. The subjects were weighed on a balance beam scale to the nearest .01kg. They were then weighed in an underwater weighing tank where body density was measured. Underwater weight was measured with a strain gauge. The signal from the strain gauge was sent to a Wheatstone bridge and then to a graphic recorder. Lung volume was measured underwater at the same time as the underwater weight using a closed-circuit, nitrogen dilution method. Three trials were executed. Percent fat was calculated and averaged from the three trials. The equipment was calibrated prior to testing. The protocol used has a coefficient of reliability of .99.

Lastly, the experimental subjects completed a Weight Control Survey (Appendix G) which initially was used for athletes at Michigan State University and was revised for this study on dancers. The survey addresses methods of weight control as well as self-image and perspectives of weight in general.

Treatment of Data

Except for the data collected from the Weight Control Survey, all data were gathered, analyzed, and presented in interval form. Nutritional data were coded from the Food Frequency Questionnaires according to instructions of the Nutritionist III computer program (77). Foods then were analyzed according to estimated intake for one day by dividing the sum of 98. Daily kcal, and percent protein,

carbohydrate, fat, and alcohol intake were obtained. The procedure was repeated for each questionnaire, two questionnaires per subject, which provided off-season and on-season values.

Data regarding caloric expenditure were taken from the Activity Journals and Activity Frequency Questionnaires. The Activity caloric expenditure was derived from energy expenditure tables derived by Cotterman (78) and Williams (79). Dance class and rehearsal times were separated by intensity level and energy expenditures were calculated using the Cohen et al. equations (80). Activity totals were divided by 98 days which determined energy expenditure per day. The subjects were assumed to sleep an average of eight hours per day. The resting metablic rate (RMR) was calculated from the tables of Williams (81). The remainder of the time not spent sleeping, dancing, or doing identified physical activities was assumed to be spent in light activity; and energy expenditure was calculated from tables by Williams (82). The daily sum of activities, dance, and RMR from the Activity Journal and the daily sum from the Activity Frequency Questionnaire were averaged to represent the estimated average kcal expenditure per day for on-season. For off-season, only the Activity Frequency Questionnaire was used to estimate average kcal expenditure per day.

Five out of the six control subjects did not keep adequate Activity Journals. Weeks were missing, or they filled out nothing at all. In these cases the Activity

Frequency Questionnaire was used alone for determining both on and off-season estimates.

Raw interval data obtained from the Nutritionist III program (83) (daily estimations of kcal intake, and percent proten, carbohydrate, fat, and alcohol), the energy expenditure tables (daily estimations of kcal expenditure), anthropometric measurements, calculations of percentage of body fat (hydrostatic weighing as well as Sloan-Weir (84) and Durnin-Wormersley (85) calculations based upon specific anthropometric measurements), and body weight determinations were analyzed using the Statistical Package for the Social Sciences (SPSS) computer system (86). Analyses included Condescriptive T-test (Groups), and T-test (Pairs). All interval data were distributed normally, skewness being > -2.0 and $< +2.2$. All variables were tested in each subprogram.

CHAPTER IV

RESULTS AND DISCUSSION

The general objective of the study was to determine whether or not any changes occur in body composition, diet and activity habits of female college repertory dancers during their dance season. The differences recorded were compared to differences observed in a control group of non-dancers. Three methods of determining percent body fat were used, providing data comparable to that of other studies.

Results

Characteristics of the dancers and their observed seasonal differences are presented in Table 2. Statistically significant differences at the $p < .05$ level are indicated in the far right column by an asterisk. The most notable decreases occurred in abdominal girth and fat, percentage of body fat, and caloric intake and expenditure.

Presented in Table 3 are the corresponding characteristics of the control subjects and their observed changes during the study. Important, statistically significant decreases occurred in caloric intake and expenditure. Increases in the calf and abdominal region also were significant. A comparison of Table 2 and 3 can be made. In general, the dancers experienced a decrease in their measurements while the controls showed an increase.

Table 2 - Dancers Observed Seasonal Differences

Weight and % Body Fat

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Weight (kg)	53.8	7.33	52.3	7.32	-1.50	0.82	•
% Body Fat (Hydrostatic Weighing)	25.3	2.92	22.9	2.82	-2.43	0.78	•
% Body Fat (Sloan-Weir)	18.8	1.15	17.6	1.07	-1.19	1.34	
% Body Fat (Durnin)	23.2	1.83	22.0	1.89	-1.21	1.97	

Anthropometric Measurements

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Neck Girth	30.8	1.66	30.4	1.76	+0.33	.29	•
Shoulder Girth	91.6	1.92	91.6	2.65	+0.03	1.24	
Abdominal Girth - 1	63.9	2.62	61.9	2.72	-2.01	.76	•
Abdominal Girth - 2	67.7	3.20	64.8	3.42	-2.92	1.99	•
Hip Girth	87.2	4.76	86.6	4.61	-0.72	2.28	
Thigh Girth	51.7	4.38	51.4	3.28	-0.28	1.74	
Knee Girth	34.8	3.48	33.8	3.18	-0.30	0.48	
Calf Girth	34.1	2.26	33.7	2.09	-0.42	0.36	•
Ankle Girth	20.4	1.67	20.4	1.52	+0.02	0.72	
Deltoid Girth	28.9	1.61	28.4	1.25	-0.53	1.00	
Biceps Girth (Ext.)	23.5	2.41	23.0	1.86	-0.42	0.87	
Biceps Girth (Flx.)	25.9	2.09	25.5	1.90	-0.42	0.68	
Forearm Girth	21.9	1.59	20.2	5.18	-1.76	4.09	
Wrist Girth	13.9	0.76	13.8	0.64	-0.15	0.24	
Subscapular Skinfold	7.8	1.47	8.0	1.90	+0.25	1.08	
Triceps Skinfold	14.8	4.84	14.4	4.04	-0.42	3.08	
Biceps Skinfold	6.7	2.68	6.6	2.22	-0.16	0.81	
Chest Skinfold	4.2	0.68	4.0	1.42	-0.16	1.36	
Midauxiliary Skinfold	6.2	1.86	5.0	0.91	-1.16	1.43	
Suprailiac Skinfold	9.6	2.27	6.5	2.56	-3.16	1.88	•
Abdominal Skinfold	11.2	2.46	8.9	2.54	-2.25	1.36	•
Thigh Skinfold	21.8	5.73	18.5	3.05	-3.33	3.38	
Knee Skinfold	8.2	1.69	9.2	2.52	+1.00	1.87	
Calf Skinfold	12.6	3.70	12.8	3.22	+0.25	1.36	

Diet

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Caloric Intake/Day	3311	848	1761	648	-1550	565	•
Caloric Expend/Day	2714	1018	1884	689	-829	711	•
% Diet Protein	13.2	4.16	15.6	5.98	+2.50	3.39	
% Diet Carbohydrate	52.3	7.03	49.0	4.56	-3.33	3.88	
% Diet Fat	31.2	6.21	32.6	6.37	+1.58	3.56	
% Diet Alcohol	3.0	3.09	2.6	1.63	-0.33	3.72	

Table 3 - Controls Observed Seasonal Changes

Weight and % Body Fat

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Weight (kg)	55.1	4.86	57.0	4.72	+1.88	0.95	•
% Body Fat (Hydrostatic Weighing)	28.7	4.03	28.3	2.87	-0.35	3.30	
% Body Fat (Sloan-Weir)	18.7	1.95	19.2	2.99	-0.53	2.13	
% Body Fat (Durnin)	23.8	3.45	19.0	10.04	-4.80	11.56	

Anthropometric Measurements

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Neck Girth	30.1	1.10	30.8	1.06	+0.66	0.54	•
Shoulder Girth	92.4	4.48	93.9	3.58	+1.56	2.00	
Abdominal Girth - 1	63.6	5.08	65.6	5.54	+1.91	1.94	
Abdominal Girth - 2	71.0	6.92	73.8	7.09	+2.80	1.98	•
Hip Girth	89.7	4.42	90.5	4.82	+0.82	2.20	
Thigh Girth	52.0	3.14	54.8	3.73	+2.70	1.63	•
Knee Girth	34.7	1.04	35.4	0.90	+0.65	0.47	•
Calf Girth	33.5	1.76	34.1	1.78	+0.58	0.36	•
Ankle Girth	20.5	1.42	20.5	1.07	-0.03	0.70	
Deltoid Girth	30.6	1.70	31.2	1.99	+0.53	0.88	
Biceps Girth (Ext.)	23.7	1.52	24.6	1.86	+0.98	0.88	•
Biceps Girth (Flx.)	26.1	1.60	26.6	1.93	+0.46	0.53	
Forearm Girth	22.3	0.78	22.7	1.14	+0.38	0.36	•
Wrist Girth	14.3	0.20	14.4	0.15	+0.05	0.84	
Subscapular Skinfold	11.0	2.32	11.2	3.12	+0.16	1.32	
Triceps Skinfold	14.2	3.41	14.2	5.86	0.00	4.56	
Biceps Skinfold	7.5	2.86	7.2	2.69	-0.33	0.88	
Chest Skinfold	6.4	2.01	7.0	2.24	+0.66	1.40	
Midauxiliary Skinfold	7.0	1.87	8.7	2.36	+1.75	1.75	
Suprailiac Skinfold	10.23	3.53	11.7	3.43	+1.58	1.77	
Abdominal Skinfold	13.3	4.81	15.3	5.22	+2.00	1.87	•
Thigh Skinfold	23.9	5.62	24.2	5.65	+0.25	4.70	
Knee Skinfold	8.0	2.08	9.6	3.85	+1.58	2.26	
Calf Skinfold	12.5	3.85	14.8	3.57	+2.25	1.72	•

Diet

	Off Season		On Season				
	$\bar{X}$	S	$\bar{X}$	S	Diff	S	p > .05
Caloric Intake/Day	3912	1652	2776	1605	-1136	664	•
Caloric Expend/Day	2914	1309	1504	295	-1409	1100	•
% Diet Protein	12.0	3.09	14.3	4.08	+2.33	2.50	
% Diet Carbohydrate	57.5	10.05	54.0	11.50	-3.50	7.84	
% Diet Fat	29.2	6.70	30.5	7.58	+1.33	6.05	
% Diet Alcohol	1.3	1.21	1.5	1.87	+0.16	1.72	

The exception occurred in caloric intake and expenditure where both groups had a decrease of approximately 1,000 kcal per day.

Heights, breadths, lengths, and widths were taken during the pretest only (before the dance season) and are presented in Table 4 for both dancers and controls. There were no significant differences between groups in any of these measurements at the $p < .05$ level. This tends to suggest that no preselection in body type occurred in this group of dancers.

Presented in Table 5 are measurements for both groups of subjects taken before the dance season. The only significant differences were in the subscapular and chest skinfolds. Dancers had significantly less subcutaneous fat in these areas prior to the dance season then did the controls.

The measurements taken immediately after the dance concert are presented in Table 6. Two girth measurements, abdominal 2 and deltoid, show a significant difference between groups. Four skinfold measurements, chest, midauxillary, suprailiac, and abdominal, also are significantly different. Percentage of body fat, determined by hydrostatic weighing, is significantly different with the dancers having less fat than the controls.

All of the differences observed show that after training, dancers have smaller measurements and less percentage of body fat than do control subjects.

Table 4 - Pretest Only Anthropometric Measurements: Dancers & Controls

	Dancers		Controls	
	$\bar{X}$	S	$\bar{X}$	S
Height (inches)	63.7	3.41	62.9	2.28
Trochanteric Height	83.6	6.11	80.7	4.78
Sitting Height	86.5	3.55	85.6	1.27
Biacromial Breadth	35.7	1.18	35.2	1.08
Biiliac Breadth	26.3	1.43	26.6	1.05
Bitrochanteric Breadth	30.2	1.79	31.3	1.75
Chest Breadth at Maximum Inspiration	25.9	0.76	25.7	0.94
Chest Breadth at Maximum Expiration	23.1	0.59	23.4	0.86
Brachium Length	31.6	1.10	31.0	1.95
Forearm Length	26.3	1.26	26.6	1.18
Foot Length	23.8	1.12	23.0	1.11
Thigh + Leg Length	78.7	5.94	75.9	4.62
Upper Extremity Length	69.2	2.87	69.4	2.92
Leg Length	37.9	2.20	37.2	2.02
Humerus Width	5.8	0.35	6.1	0.28
Wrist Width	4.5	0.29	4.7	0.15
Femur Width	8.4	0.67	8.9	0.34
Knee Width	8.4	0.82	8.5	0.38
Ankle Width	6.3	0.42	6.2	0.16

Table 5 - Off - Season Measurements: Dancers and Controls

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Neck Girth	30.0	1.65	30.1	1.10	
Shoulder Girth	91.6	1.92	92.4	4.48	
Abdominal - 1 Girth	63.9	2.62	63.6	5.08	
Abdominal - 2 Girth	67.7	3.28	71.0	6.92	
Hip Girth	87.2	4.75	89.7	4.41	
Thigh Girth	51.7	4.38	52.0	3.13	
Knee Girth	34.0	3.40	34.7	1.04	
Calf Girth	34.1	2.26	33.5	1.70	
Ankle Girth	20.4	1.67	20.5	1.42	
Deltoid Girth	28.9	1.61	30.6	1.70	
Biceps Girth (Ext)	23.5	2.41	23.7	1.51	
Biceps Girth (Flx)	25.9	2.09	26.1	1.60	
Forearm Girth	21.9	1.59	22.3	0.78	
Wrist Girth	13.9	0.76	14.3	0.20	
Subscapular Skinfold	7.8	1.47	11.0	2.32	*
Triceps Skinfold	14.8	4.84	14.1	3.41	
Biceps Skinfold	6.7	2.68	7.5	2.86	
Chest Skinfold	4.2	0.68	6.4	2.01	*
Midauxillary Skinfold	6.2	1.86	7.0	1.87	
Suprailiac Skinfold	9.6	2.27	10.2	3.53	
Abdominal Skinfold	11.2	2.46	13.3	4.81	
Thigh Skinfold	21.8	5.73	23.9	5.62	
Knee Skinfold	8.2	1.69	8.0	2.08	
Calf Skinfold	12.6	3.70	12.6	3.85	

Weight and % Body Fat (Off Season)

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Weight (kg)	53.8	7.33	55.1	4.86	
% Body Fat	25.3	2.92	28.7	4.03	
% Body Fat (Sloe-Weir)	18.8	1.15	18.6	1.95	
% Body Fat (Durnin)	23.2	1.83	23.8	3.45	

Diet (Off Season)

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Caloric Intake/Day	3311	840	3912	1652	
Caloric Expenditure/Day	2714	1018	2914	1309	
% Protein	13.2	4.16	12.0	3.09	
% Carbohydrate	52.3	7.03	57.5	10.05	
% Fat	31.2	6.21	29.2	6.70	
% Alcohol	3.0	3.09	1.3	1.21	

Table 6 - On - Season Measurements: Dancers and Controls

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Neck Girth	30.4	1.75	30.8	1.06	
Shoulder Girth	91.6	2.65	93.9	3.57	
Abdominal - 1 Girth	61.9	2.72	65.5	5.54	
Abdominal - 2 Girth	64.8	3.42	73.8	7.09	*
Hip Girth	86.5	4.61	90.5	4.82	
Thigh Girth	51.4	3.28	54.7	3.73	
Knee Girth	33.8	3.18	35.4	0.90	
Calf Girth	33.7	2.09	34.1	1.78	
Ankle Girth	20.4	1.52	20.5	1.07	
Deltoid Girth	28.4	1.25	31.2	1.99	*
Biceps Girth (Ext)	23.0	1.87	24.6	1.86	
Biceps Girth (Flx)	25.5	1.97	26.6	1.93	
Forearm Girth	20.2	5.18	22.7	1.14	
Wrist Girth	13.8	0.64	14.4	0.15	
Subscapular Skinfold	8.0	1.90	11.2	3.12	
Triceps Skinfold	14.4	4.04	14.2	5.86	
Biceps Skinfold	6.5	2.22	7.2	2.69	
Chest Skinfold	4.0	1.42	7.0	2.24	*
Midauxiliary Skinfold	5.0	0.92	8.7	2.36	*
Suprailiac Skinfold	6.5	2.56	11.7	3.43	*
Abdominal Skinfold	8.9	2.53	15.3	5.22	*
Thigh Skinfold	18.5	3.05	24.2	5.65	
Knee Skinfold	9.2	2.52	9.6	3.85	
Calf Skinfold	12.8	3.22	14.8	3.57	

Weight and % Body Fat (On Season)

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Weight (kg)	52.3	7.32	57.0	4.72	
% Body Fat	22.9	2.82	28.3	2.87	*
% Body Fat (Sloe-Weir)	17.5	1.07	19.2	2.99	
% Body Fat (Durnin)	22.0	1.89	19.0	10.04	
% Lost Fat of Fat Available to Lose	18.7	6.5	0.0	1.85	*

Diet (On Season)

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	p > .05
Caloric Intake/Day	1761	648	2776	1605	
Caloric Expenditure/Day	1884	689	1504	295	
% Protein	15.6	5.98	14.3	4.08	
% Carbohydrate	49.0	4.56	54.0	11.50	
% Fat	32.6	6.37	30.5	7.58	
% Alcohol	2.6	1.63	1.5	1.87	

Also presented in Table 6 is "percentage lost fat of fat available to lose". This was determined by the subject's initial percentage of body fat (hydrostatic weighing) minus their posttested percentage of body fat to establish the percentage of body fat lost. It has been determined that a healthy woman's minimum percent body fat is approximately 12% (87). Therefore, each subject's initial percentage of fat minus 12% became the percentage of fat available to lose. The dancers in this study lost 18.7% of their body fat available to lose. The controls lost 0% of that fat available to lose. This difference between controls and dancers was significant.

A primary purpose of this investigation was to evaluate differences in measurements of dancers from off-season to on-season. Dancer's differences in the sum of girths and in the sum of skinfolds were compared to those of the controls. The dancer's girths decreased 9.5 cm while controls increased 14.0 cm. The dancer's skinfolds decreased 9.2 mm while controls increased 9.9 mm. Both of these comparisons are statistically significant ($p < .05$) as well as practically important. The specific anthropometric measurements are presented in Table 7.

Seven out of fourteen girth differences between the dancers and controls were statistically significant. The abdominal girths show the greatest difference. Four out of ten skinfold differences were significant. These were mostly measurements from the trunk as opposed to the limbs.

Table 7 - Differences from Off - Season to On - Season: Dancers and Controls

	Dancers		Controls		
	$\bar{X}$	S	$\bar{X}$	S	$p > .05$
Neck Girth	0.33	0.29	0.66	0.54	
Shoulder Girth	0.03	1.24	1.56	2.00	
Abdominal Girth - 1	-2.01	0.76	1.91	1.94	•
Abdominal Girth - 2	-2.92	1.99	2.80	1.98	•
Hip Girth	-0.72	2.28	0.82	2.20	
Thigh Girth	-0.28	1.74	2.70	1.63	•
Knee Girth	-0.30	0.40	0.65	0.47	•
Calf Girth	-0.42	0.36	0.58	0.36	•
Ankle Girth	0.02	0.72	-0.03	0.70	
Deltoid Girth	-0.53	1.00	0.53	0.87	
Biceps Girth (Ext.)	-0.42	0.87	0.98	0.88	•
Biceps Girth (Flx.)	-0.42	0.68	0.46	0.53	•
Forearm Girth	-1.76	4.09	0.38	0.36	
Wrist Girth	-0.15	0.24	0.05	0.08	
Subscapular Skinfold	0.25	1.08	0.16	1.32	
Triceps Skinfold	-0.42	3.08	0.00	4.56	
Biceps Skinfold	-0.16	0.82	-0.33	0.88	
Chest Skinfold	-0.16	1.36	0.66	1.40	
Midauxiliary Skinfold	-1.16	1.43	1.75	1.75	•
Suprailiac Skinfold	-3.16	1.08	1.58	1.77	•
Abdominal Skinfold	-2.25	1.36	2.00	1.87	•
Thigh Skinfold	-3.33	3.38	0.25	4.70	
Knee Skinfold	1.00	1.87	1.58	2.26	
Calf Skinfold	0.25	1.36	2.25	1.72	•
Weight	-1.50	0.82	1.86	0.95	•
% Body Fat (Hydrostatic Weighing)	-2.43	0.78	-0.35	3.30	
% Protein	2.50	3.39	2.33	2.50	
% Carbohydrate	-3.33	3.88	-3.50	7.84	
% Fat	1.5	3.56	1.33	6.05	
Caloric Intake	-1550	565	-1136	664	
Caloric Expenditure	-829	711	-1409	1100	

The difference in body weight also was significant at the $p < .05$ level.

Percentage of body fat in both groups decreased, although only a minimal amount in the control group. Both groups showed almost identical diet and activity patterns. Protein and fat consumption increased slightly, while carbohydrate consumption showed a moderate decrease.

Both groups had a decrease in their caloric intake by over 1,000 kcal. Surprisingly, both groups also decreased their activity levels which shows that dancers as well as controls expended more energy during the warmer months and suggests that dancers may be more active when they are not dancing. When they danced, they did not expend as much energy as they did in their non-dancing activities. This probably was affected by the seasonal factor previously mentioned. People tend to participate in more physical activities during the summer than the winter. The classes and rehearsals did not make up for the dancer's winter activity deficit.

Discussion

All measurements compare favorably with those obtained in previous studies as is outlined in Table 8 which presents the dancer's on-season measurements other than their anthropometric measurements which were taken only during the pretest. The on-season measurements are likely to be most representative of the dancers in this study when

Table 8 - Comparison of This Investigations Measurements on Dancers to Previous Studys Measurements

Anthropometric Measurements

	NANCY	SOLOMON	EVANS	CALABRESE	JOHNSON	CONLEE	POSTNIKOV	LIVOIE	NICOLI	PETERSON	CHAMBERS	MITCHELL
	87	80	85	83	78	83	86	82	84	86	81	83
Height(in)	63.7	64.5		66.1	64.0	65.3	64.9	63.7	64.5	64.5		
Biacromial Breadth	35.7	31.8										
Biiliac Breadth	26.3	25.9										
Bitrochanteric Breadth	30.2	31.1										
Humerus Width	5.8	6.4										
Wrist Width	4.5	4.6										
Knee Width	8.4	9.0										
Ankle Width	6.3	6.4										
Neck Girth	30.4	29.2										
Shoulder Girth	91.6	92.6										
Abdominal 1 Girth	61.9	62.7										
Abdominal 2 Girth	64.8	68.6										
Hip Girth	86.6	86.2										
Thigh Girth	51.4	50.2										
Knee Girth	33.8	33.1										
Calf Girth	33.7	34.3										
Ankle Girth	20.4	20.5										
Deltoid Girth	28.4	28.4										
Biceps (Ext)	23.0	22.2										
Biceps (Flx)	25.5	24.6										
Forearm Girth	20.2	21.3										
Wrist Girth	13.8	14.3										
Subscap. Skinfold	8.0	8.8	10.2		7.8	10.3						
Triceps Skinfold	14.4		13.8		9.6	12.2						
Biceps Skinfold	6.6	10.6										
Abdom. Skinfold	5.0	6.2										
Suprailiac Skinfold	6.5	7.4	9.3		9.2	17.8						
Abdominal Skinfold	8.9	8.1	14.9									
Thigh Skinfold	18.5	18.7	21.9	14.4		17.3						
Knee Skinfold	9.2	9.2										
Calf Skinfold	12.8		14.4			12.9						

Table 8 - Comparison of This Investigations Measurements on Dancers to Previous Studys Measurements

Weight and % Body Fat

	MARCY 87	DOLGNER 80	EVANS 85	CALABRESE 83	NOVAK 78	COHEN 85	MOSTARDI 86	LAVOIE 82	MICHELI 84	PETERSON 86	CHAMBERS 81	KIRKENDALL 83
Weight (kg)	52.3	51.8	53.5	54.5		48.4	50.0	47.6	48.0	50.5		
% Fat (Hydro)	22.9		22.4	16.9							12.7	13.8
% Fat (Sloan)	17.6				20.5							
% Fat (Durnin)	22.0											
% Fat (Sinning)									15.3			
% Fat (Zwiren)								15.5				
% Fat (Jackson)						12.8						
% Fat (Wilmore)		22.1										

Diet

	MARCY 87	DOLGNER 80	EVANS 85	CALABRESE 83	NOVAK 78	COHEN 85	MOSTARDI 86	LAVOIE 82	MICHELI 84	PETERSON 86	CHAMBERS 81	KIRKENDALL 83
kcal/day	1761			1358		1673	1200					
% Pro	15.6			7-81		14.2						
% CHO	49.0			10-62		50.1						
% Fat	32.6			26-82		38.0						

compared to the data collected on other college and professional dancers.

The mean body weights of dancers in previous studies ranged from 47.6 kg to 54.5 kg. The dancers in this study had an average body weight of 52.3 kg which places them in the upper half of the range of body weights for dancers.

Percentage of body fat is determined using a variety of methods, hydrostatic weighing being the most valid and reliable. The dancers in this study were estimated to have 22.9% body fat, the highest value shown in Table 8. Consideration should be given to the variations and validities of the various methods used.

The reported mean height for the dancers in this study was 5' 3.7". They were among the shortest dancers that have been measured. The tallest dancers were reported by Peterson (88) at an average height of 5' 6.1". Note that although the experimental subjects could be considered short, the average difference between the shortest and tallest groups of dancers is only about 3 inches.

Anthropometric measurements across groups of dancers are very consistent in almost all instances. Skinfold measurements demonstrated the greatest variance. The dancers in this study had relatively small skinfold measurements at the subscapular, biceps, suprailiac, and calf skinfold sites. Relatively large measurements were obtained at the triceps and knee.

Measurements of the dancer's diets also compare favorably with the results obtained in the few other studies that

exist. Daily caloric intake was estimated at 1761 kcal for the experimental subjects; whereas, 1673, 1358, and 1200 kcal per day are reported for studies by Cohen et al. (89), Calabrese et al. (90), and Mostardi (91), respectively. Daily percentages of protein and carbohydrate intakes reported in this study and by Cohen et al. (92) are within 2% of each other. Daily percentage of fat intake was 32.6% for the experimental subjects in this study and 38.0% for Cohen's (93) dancers.

As stated previously, the experimental subjects' caloric intake was 1761 kcal per day. This is slightly below their calculated energy needs when Peterson's (94) equations are applied:

(Body Weight lb.) x (15) + (200 kcal/DANCE CLASS/DAY)

Experimental subjects:

(115) x (15) + (400 kcal) = 2125 kcal/day

This assumes that the dancers participated in the equivalent of two classes per day, a suitable estimate when taking rehearsals into consideration. The dancers appear to have been deficient 364 kcal/day.

The experimental subjects completed a Weight Control Survey at the end of the dance season. Only one subject reported bulimic practices and the use of laxatives to lose or maintain weight. The most popular choices for weight reduction or maintenance include exercising more, cutting down on snacks, cutting down on junk food, and eating smaller meals without counting calories. These are all logical and accepted procedures to reduce excess body

weight or to maintain body weight. In general, the dancers in this study appeared to be weight conscious, although not obsessive in nature.

CHAPTER V

CONCLUSIONS

This investigation was designed to evaluate changes in six female dancers during a season of training for a college repertory dance company. Five hypotheses were tested, and three were accepted at the $p < .05$ level.

Summary

The first hypothesis stated that dancers would show a significant decrease in their percentage of body fat from off-season to on-season. The dancers began with 25.3% fat and ended with 22.9%. The first hypothesis was accepted at the $p < .05$ level.

The second hypothesis stated that dancers will have a significantly greater change in percentage of body fat, then will a group of non-dancers, from off-season to on-season. Although the dancers percentage of body fat decreased over 2%, the controls also decreased from 28.7% to 28.3%, and the difference between groups was not statistically significant ($p > .05$). Therefore, the second hypothesis was rejected. (Kirkendall and Calabrese (95) reported that body fat in professional dancers changed from 13.4% to 13.8% from pre to peak season which contradicts the finding of this investigation.)

The third hypothesis stated that dancers would have significantly larger differences in girth and skinfold

measurements, from off-season to on-season, than would a group of control subjects. Changes in the sum of girth measurements as well as in the sum of skinfold measurements were significantly different at the $p < .05$ level. Specifically, abdominal, thigh, knee, calf, and biceps girths as well as midauxillary, suprailiac, abdominal, and calf skinfolds showed signficance. The third hypothesis was accepted.

The fourth hypothesis stated that the dancers would significantly decrease their caloric intake from off-season to on-season. In fact, the dancers went from 3311 to 1761 kcal per day. This is significant at the $p < .05$ level and the hypothesis is accepted. However, it should be noted that when the changes in caloric intakes of the dancers were compared with those of the controls, there was no significant difference. The control subjects also decreased their caloric intake during the course of the study.

The last hypothesis stated that the dancers would show a significant increase in caloric expenditure from off-season to on-season. This hypothesis was rejected. The dancers decreased their average caloric expenditure by 829 kcal per day, a finding contradictory to what one might expect.

Suggested Research

Following is a list of suggested research to further knowledge of the physiological effects of dance in college repertory dancers.

1. An ongoing investigation should be conducted using an entire college repertory company in an attempt to establish norm values and trends of seasonal differences for this type of subject.
2. Many more studies are needed comparing off-season and on-season measurements to determine the effects of dance training in college-level dancers.
3. An extensive dietary evaluation is needed which will take dormitory food into consideration for its effect on changing dietary habits from off-season to on-season.
4. Investigations involving male dancers are more scarce than those involving females, this should be corrected.

Research on dance is still in its infancy. Educators and their institutions have a responsibility to nurture this up and coming movement so that the art of dance and the science of dance may grow together.

APPENDICES

APPENDIX A

CONSENT FORM

APPENDIX A

CONSENT FORM

MICHIGAN STATE UNIVERSITY
CENTER FOR THE STUDY OF HUMAN PERFORMANCE

Informed Consent

The exercise test(s) and procedure(s) to be used in the study of _____

_____ have been explained to me. I agree to serve voluntarily as a subject in the research described. I understand that this research is being undertaken to further knowledge concerning the responses of individuals to exercise regimens. I understand that some physical discomfort may be experienced and that no beneficial effects are guaranteed. I have had an opportunity to ask questions regarding the test(s) and procedure(s) to be used and have been informed that I am free to withdraw my consent and to discontinue my participation at any time. I understand that the results may be used in scientific publication(s) with anonymity assured, that the data of individuals will be treated in strict confidence, and that within these restrictions my results will be made available to me upon my request. I understand that if I am injured as a result of my participation in this research project, Michigan State University will provide emergency medical care, if necessary, but these and any other medical expenses must be paid from my own health insurance program.

_____ _____

Subject Signature Investigator Signature

_____ _____

Date Date

APPENDIX B

BALLET CLASS - AMERICAN BALLET THEATRE

APPENDIX B

BALLET CLASS - AMERICAN BALLET THEATRE

Barre Exercises

Adagio 3/4 (4 min): demi and grand plié; port de corps; balance soussus.

Moderato 4/4 (4 min): battement tendu with plié and flex; turn-in. turn-out.

Allegro 4/4 (1 min 55 s): battement dégagé; pas de cheval.

Allegro 3/4 (5 min): rond de jambe à terre, grand rond de jambe, retiré to arabesque (flat and en relevé); circular port de corps; relevé passé.

Allegro 3/4 (1 min 45 s); battement double frappé; balance passé to attitude to arabesque.

Adagio 4/4 (6 min): developpé to grand rond de jambe to arabesque penché; retiré to passé, developpé to 2nd; port de bras; repeat en relevé; lunge then to arabesque. balance en releve.

Allegro 4/4 (1 min 15 s): grand battement (pointed, flexed, developpé, retiré); balance (passé).

Center Floor Exercises

Moderato 4/4 (1 min 20 s): dégagé, coupé ballonné; pas de bourrée; pirouettes en dehors and en dedans.

Adagio 3/4 (2 min): walk phrase; piqué arabesque and en avant; grand rond de jambe, pas de bourrée en tournant.

Moderato 3/4 (1 min 25 s): waltz phrase; arabesque and attitude turns; balancé en tournant; pirouettes en dedans and en dehors.

"Petit Allegro" 4/4 (1 min): entrechat quatre; entrechat royale; changement; échappé.

"Grand Allegro" 3/4 (1 min 10 s): temps de flèche; piqué arabesque; cabriole; balancé en tournant; grand jeté; run.

APPENDIX C

BALLET CLASS - MICHIGAN STATE UNIVERSITY

REPERTORY DANCE COMPANY

APPENDIX C

BALLET CLASS - MICHIGAN STATE UNIVERSITY REPERTORY DANCE COMPANY

Barre Exercises

Adagio 3/4 (3 min 58 s): 1 grand plié, 2 demi plié's with port de bras; first, second, fourth, and fifth positions; end soussus.

Moderato 4/4 (2 min 45 s): tendu plié en croix; tendu flex and point close fifth encroix; tendu rotate in and out close fifth en croix.

Allegro 4/4 (1 min 10 s): 7 dégagé's first, close fifth dessuos; 7 dégagé's first close fifth dessus; pas de cheval en croix, 4 àla seconde close fifth; repeat.

Allegro 3/4 (4 min 36 s): Rond de jambe à terre - 8 endehors and 8 endedans; Grand rond de jambe en l'air endehors and endedans; retiré, arabesque and fondu; relevé, retiré and soussus; full cambré toward the barre and away; passé relevé, balance.

Allegro 3/4 (2 min 12 s): Preperation, double frappé en croix, and 4 àla seconde; repeat 4 times; relevé passé to attitude and arabesque, balance.

Adagio 4/4 (4 min 5 s): Developpé grand rond de jambe endedans; penché; retiré developpé; repeat en relevé; retiré and lunge; arabesque fondu; relevé, balance.

Allegro 4/4 (3 min 25 s): Grand battement encroix pointed; repeat flexed; repeat developpé; repeat enveloppé; passé relevé, balance.

Center Floor Exercises

Moderato 4/4 (1 min 2 s): Dégagé, coupé ballonné; pas de bourrée dessuos to fourth position; pirouette endehors, pirouette endedans, close fifth dessuos; repeat reversed.

Adagio 3/4 (3 min): Walk a circular path for 4 phrases; piqué arabesque, hold; retiré to en face; developpé à la quatrième devant; grand rond de jambe to arabeque; pas de bourrée en tournant endehor; repeat reversed.

Moderato 3/4 (1 min 48 s): Begin facing corner 1. Balancé, balancé; piqué arabesque entournant; attitude relevé entournant: balancé entournant; lunge, prepare for pirouette; pirouette endedans; repeat reversed.

Petite Allegro (1 min 28 s): Entrechat quatre; royale, 2 changements, 2 échappé sauté changes; repeat reversed.

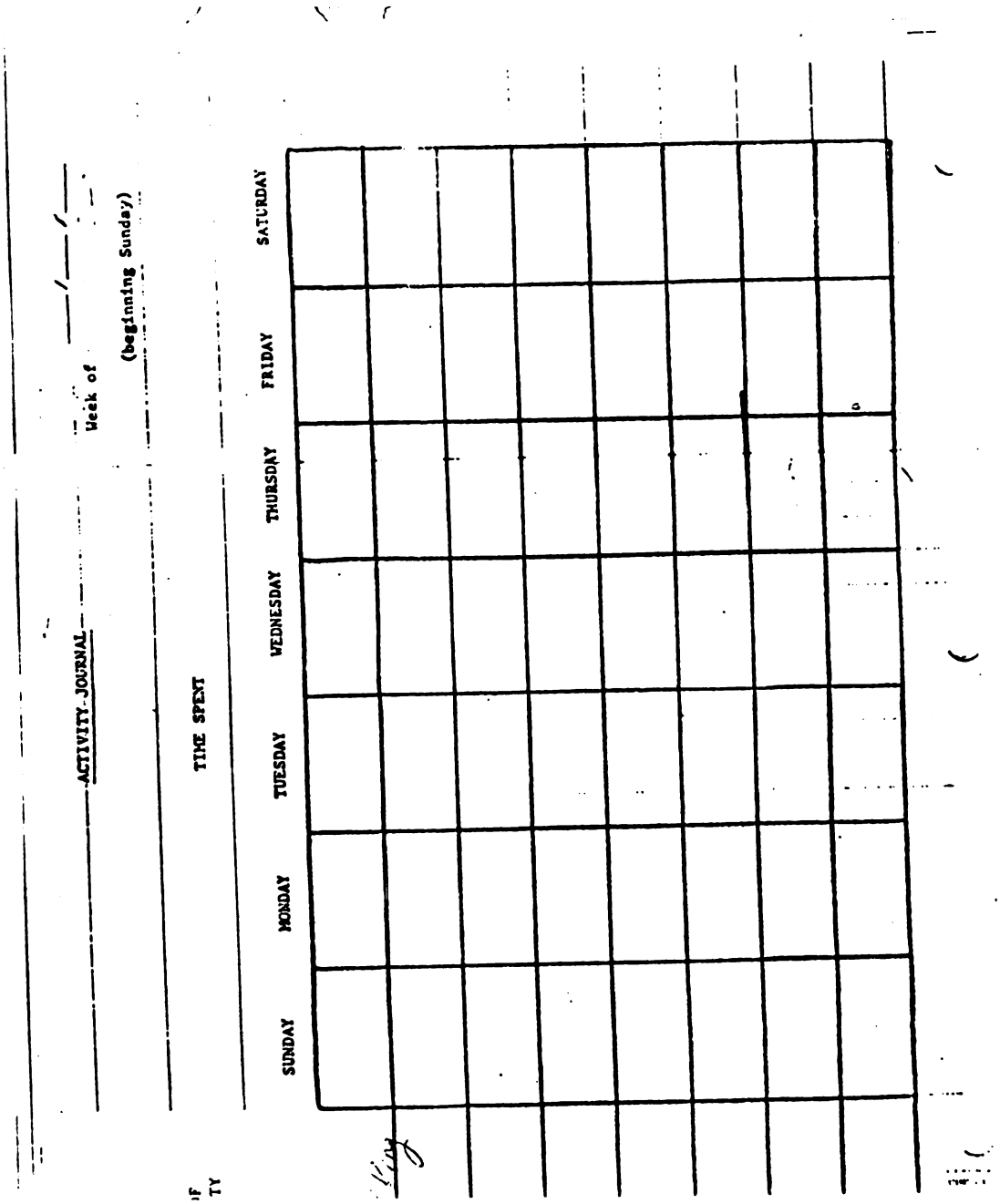
Grand Allegro 3/4 (approximately 2 min): Step left, temps de flèche to corner 2; piqué arabesque; step right, cabriole to corner 4; balancé entournant; run grand jeté; run off; repeat reversed.

APPENDIX D

ACTIVITY JOURNAL

APPENDIX D

ACTIVITY JOURNAL



SUBJECT # _____

LOW INTENSITY

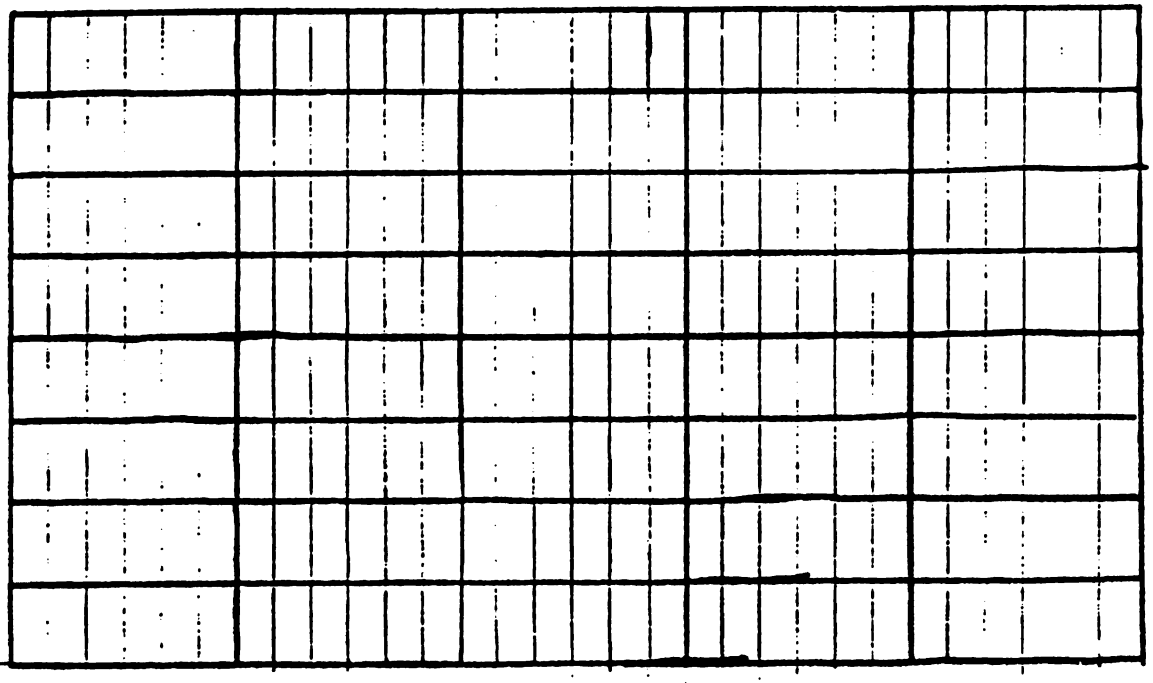
less strenuous than given

BARRE

REHEARSALS & DANCE CLASSES

Week of ____/____/____
(beginning Sunday)

Mark off boxes of 10 minute intervals
(each large box = 1 hour)



SUBJECT # _____

REHEARSALS & DANCE CLASSES

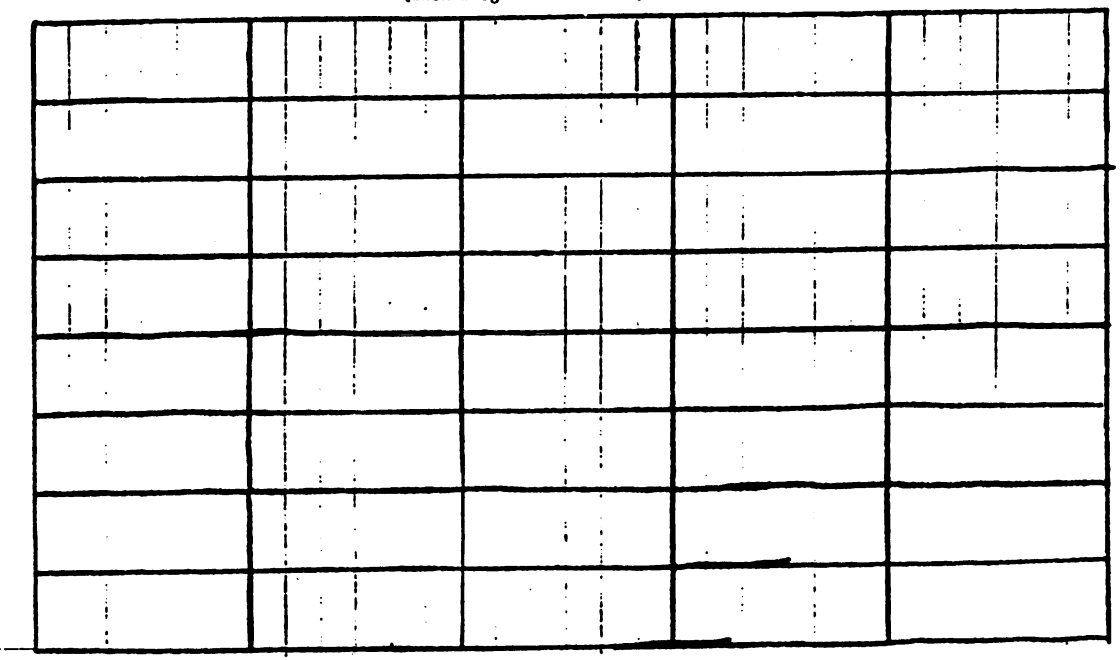
HIGH INTENSITY

as strenuous as given

CENTER FLOOR

Week of ____/____/____
(beginning Sunday)

Mark off boxes of 10 minute intervals
(each large box = 1 hour)



SUBJECT # _____

MODERATE INTENSITY

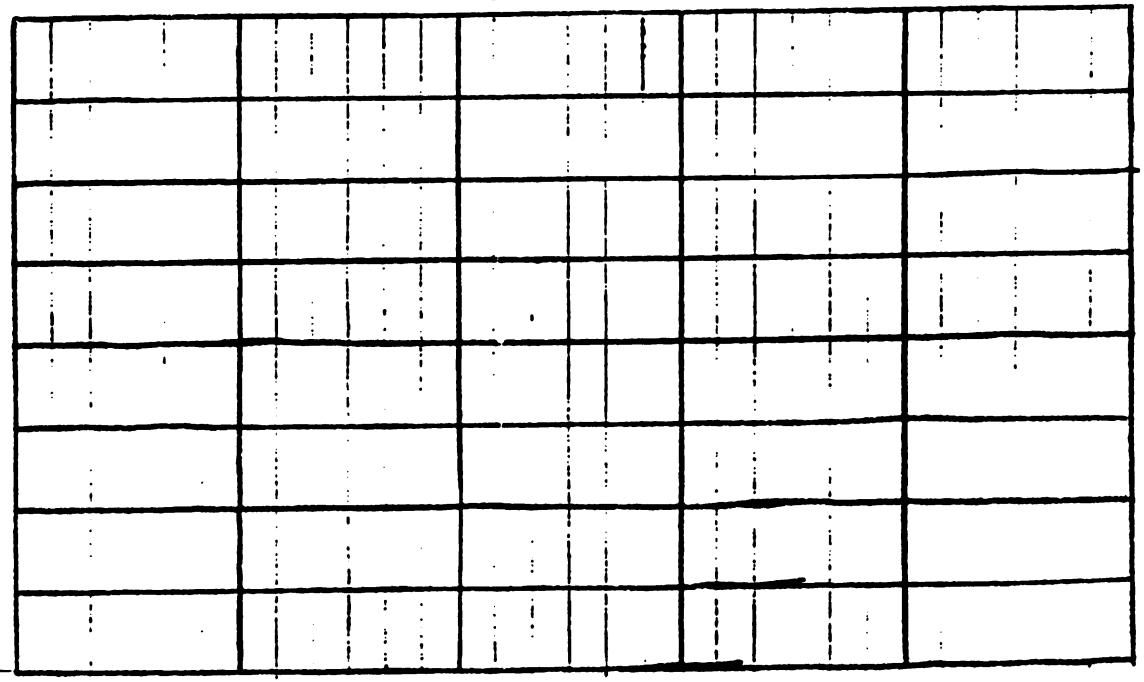
as strenuous as given

BARRE

REHERSALS & DANCE CLASSES

Week of ____/____/____
(beginning Sunday)

Mark off boxes of 10 minute intervals
(each large box = 1 hour)



APPENDIX E

ACTIVITY FREQUENCY QUESTIONNAIRE

APPENDIX E

ACTIVITY FREQUENCY QUESTIONNAIRE

Subject #_____

ACTIVITY	TYPICAL HOURS SPENT	DAILY	WEEKLY	MONTHLY	YEARLY
Walking					
Running(12 min mile)					
" (10 min mile)					
" (8 min mile)					
Skipping rope					
Rollerskating					
Skiing(water)					
" (cross country)					
" (downhill)					
Swimming(pleasure)					
" (vigorous)					
Canoeing					
Rowing					
Tennis					
Volleyball					
Golf					
Bicycling(5 mph)					
" (15 mph)					
Ice skating					
Dancing(technique)					
" (pleasure)					
" (aerobic)					
Judo/Karate					
Calisthenics					
Household chores					
-specify _____					
Stairs					
Gardening					
Sailboarding					
Other					
-specify _____					

APPENDIX F

FOOD FREQUENCY QUESTIONNAIRE

APPENDIX F

FOOD FREQUENCY QUESTIONNAIRE

INSTRUCTIONS FOR THE FOOD FREQUENCY QUESTIONNAIRE

This is a listing of some foods eaten in the United States. Please give your best estimate of how frequently you consume these foods when they are available to you in any form (fresh, frozen, canned, dried, etc.). More specifically, on how many occasions do you eat them and in what typical servings?

The response categories are listed to the right of the food list. There are two components to your response to each food, serving size and frequency. 1) Your description of a TYPICAL SERVING, and 2) your estimate of the number of occasions you eat the food under one of the following categories: DAILY, WEEKLY, MONTHLY, YEARLY. For foods you eat rarely or never, please just check the appropriate category, RARELY OR NEVER. For each food eaten daily, weekly, monthly, or yearly describe what you would eat in a typical serving. For typical serving size use whatever units you feel comfortable with--for example, piece, cup, bowl, glass, slice, can, carton, teaspoon, shake, handful, bunch, tablespoon, scoopful, serving, and so on. Next, describe how often you eat that food under only one of the categories, DAILY, WEEKLY, MONTHLY, or YEARLY. Naturally, you should feel free to use whichever frequency category is easiest to think about for each food.

For example: if you typically drink one glass of milk for breakfast and lunch daily....

	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY OR NEVER
MILK	1 glass	2				

under "TYPICAL SERVING SIZE" write "1 glass" and under "DAILY" write "2".

OR, if you typically drink half of a glass of milk on 3 occasions in a month....

MILK	½ glass			3		

under "TYPICAL SERVING SIZE" write "1/2 glass" and under "MONTHLY" write "3".

OR, if if you typically drink 2 glasses of milk on 4 occasions during the week....

MILK	2 glasses		4			

under "TYPICAL SERVING SIZE" write "2 glasses" and under "WEEKLY" write "4".

OR, if you rarely or never drink milk just check "RARELY OR NEVER".

MILK						✓

Proceed as rapidly and as carefully as you can. Thank you.

	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY / NEVER
FLESH FOODS						
Beef: hamburger [ground beef]						
Beef: any other meat cut						
Beef: any organ meat						
Goat: any cut						
Horse: any cut						
Lamb: any cut						
Pork: bacon/sausage						
Pork: smoked/canned ham						
Pork: any other meat cut						
Wild game: any variety						
Luncheon Meats: bologna type						
Luncheon Meats: hot dogs [frankfurters]						
Luncheon Meats: salami [hard/dried form]						
Luncheon Meats: salami [soft/cooked form]						
Chicken: any meat cut						
Chicken: any organ meat						
Turkey: any meat cut						
Fish: any fresh/cooked variety						
Fish: any canned variety						
Fish: any dried variety						
Shellfish: any fresh/cooked variety						
Shellfish: any canned variety						
Shellfish: any dried variety						
Other Flesh Foods Eaten at Least Monthly:						
[please identify] _____						
[please identify] _____						
[please identify] _____						

2	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY OR NEVER
DAIRY FOODS						
Cheese: cottage/soft varieties						
Cheese: any other variety						
Cream: any natural, unsoured form						
Cream: any natural, sour form						
Cream: processed cream substitute						
Eggs: chicken [any form of preparation]						
Eggs: egg substitute						
Ice cream: any variety						
Ice milk: any variety						
Frozen yoghurt: any variety						
Sherbet: any variety						
Milk: cow's, whole						
Milk: cow's, low-fat						
Milk: cow's, evaporated/dried forms						
Milk: goat's, any form						
Milk: milk substitute [soy base]						
Yoghurt: any unsweetened variety						
Yoghurt: any sweetened variety						
Other Dairy Foods [excluding butter] Eaten at Least Monthly:						
[please identify] _____						
[please identify] _____						
[please identify] _____						
FATS AND OILS						
Butter: any form						
Margarine: any form						
Salad Dressing: any form						
Fats: lard						
Fats: vegetable shortening						
Oils: any vegetable form						

3	SERVING SIZE	DAILY	WEEKLY	MONTHLY	YEARLY	RARELY O NEVER
Other Fats/Oils Eaten at Least Monthly:						
[please identify] _____						
[please identify] _____						
[please identify] _____						
GRAINS AND STARCHES						
Breads: loaf, wheat, whole wheat						
Breads: loaf, wheat, white						
Breads: loaf, wheat, any other form						
Breads: loaf, rye						
Breads: pan style cornbread						
Breads: rolls, breakfast, any sweet form						
Breads: rolls, breakfast, any non-sweet muffin/biscuit form						
Breads: rolls, dinner types						
Breads: rolls, hamburger/hotdog buns						
Breads: specialty, crepes/pancakes/waffles						
Breads: specialty, tortillas [corn or wheat]						
Cakes: any cupcake/twinkie variety						
Cakes: any layer variety						
Cakes: any fruit cake variety						
Cookies: any variety with fruit as an ingredient						
Cookies: any variety with peanut butter as an ingredient						
Cookies: any variety with oatmeal as an ingredient						
Cookies: any other variety						
Breakfast cereal: hot, oatmeal type						
Breakfast cereal: hot, wheat type						
Breakfast cereal: cold, any high fiber type						
Breakfast cereal: cold, any low fiber type, no sugar						
Breakfast cereal: cold, any low fiber type with sugar						
Breakfast cereal: cold, granola						
Whole grains: bulgar						
Whole grains: corn, on cob/whole kernel						
Whole grains: corn, hominy/grits						

4	SERVING SIZE	DAILY	WEEKLY	MONTHLY	YEARLY	RARELY O NEVER
Whole grains: rice, brown varieties						
Whole grains: rice, white polished						
Whole grains: rice, instant/minute						
Whole grains: triticale						
Whole grains: wild rice						
Pasta: rice, rice noodles						
Pasta: spinach, spinach noodles						
Pasta: wheat, any stuffed variety						
Pasta: wheat, any "string/noodle" variety						
Dinner Starch: potato, baked in skin						
Dinner Starch: potato, french fries						
Dinner Starch: potato, mashed with milk						
Dinner Starch: potato, any other form except potato chips						
Dinner Starch: sweet potato						
Dinner Starch: yams, baked						
Dinner Starch: yams, candied						
Dinner Starch: yucca/manioc						
Other Grains/Starches Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						
VEGETABLES						
Artichoke						
Asparagus						
Bamboo shoots						
Beets						
Bok Choy						
Broccoli						
Brussels Sprouts						
Cabbage: American variety [red or green]						
Cabbage: Chinese variety						
Carrots						
Cauliflower						
Celery						
Chives						
Cucumber						

5	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY OR NEVER
Eggplant						
Garlic						
Greens: any form of vegetable green						
Kale						
Kohlrabi						
Leeks						
Lettuce						
Mushrooms						
Okra						
Onions: green						
Onions: mature [brown or white]						
Parsley						
Parship						
Peppers: any hot form						
Peppers: any sweet form						
Prickly Pear Leaves						
Pumpkin						
Raddishes						
Rhubarb						
Rutabaga						
Seaweed: any form						
Shallots						
Spinach						
Sprouts: any form of vegetable sprout						
Squash: any form of squash						
Tomatoes: any fresh form						
Tomatoes: paste or sauce						
Tomatillos						
Turnips						
Water chestnuts						
Water cress						
Other Vegetables [excluding legumes] Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						

	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY / NEVER
LEGUMES						
Beans: black-eye peas						
Beans: any red form						
Beans: any white form						
Beans: any yellow form						
Beans: fresh string beans (snap beans)						
Garbanzos (chickpeas)						
Lentils						
Peas						
Peas: snow peas						
Soybean: any fermented form						
Other Legume Eaten at Least Monthly:						
[please identify] _____						
[please identify] _____						
[please identify] _____						
NUTS AND SEEDS						
Almonds						
Peanuts: oil roasted						
Peanuts: dry-roasted						
Walnuts						
Squash Seeds						
Sunflower Seeds						
Other Nuts/Seeds Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						
BERRIES, FRUITS, AND MELONS						
Cranberries: whole or crushed						
Strawberries						
Other Berries Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						

	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY OR NEVER
Apples [any form]						
Apricots						
Avocado						
Bananas						
Cherries: fresh						
Cherries: maraschino						
Dates						
Figs						
Grapefruit: pink or white						
Grapes: fresh						
Grapes: dried [raisins]						
Kiwi						
Litchi						
Mango						
Olives: green						
Olives: ripe [black]						
Oranges [any form]						
Peaches						
Pears						
Pineapple [any form]						
Plums: fresh						
Plums: dried [prunes]						
Pomegranate						
Prickly Pear Fruit						
Tangerines						
Other Fruits Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						
Cantaloupe						
Casaba Melon						
Honeydew melon						
Watermelon						
Other Melons Eaten at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						

8

BEVERAGES	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY OR NEVER
Hot: Bouillon						
Hot: Chocolate [milk + syrup/powder]						
Hot: Chocolate [water + syrup/powder]						
Hot: Coffee [ground/powdered/instant]						
Hot: Coffee [flavored types]						
Hot: Tea [teabag/leaf types]						
Hot: Tea [instant, sugar added]						
Hot: Tea [instant, dietetic with lemon]						
Hot: Tea [herb teas]						
Other Hot Beverages Consumed at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						
Alcoholic: ale/beer [any variety]						
Alcoholic: liqueurs [any variety]						
Alcoholic: spirits [any variety, example, bourbon, brandy, gin, rum, vodka, etc]						
Alcoholic: wines [dessert/aperitif]						
Alcoholic: wines [dinner: any red, rose, white table variety]						
Carbonated: cola-like with sugar						
Carbonated: cola-like, dietetic						
Carbonated: 7-up like, with sugar						
Carbonated: 7-up like, dietetic						
Carbonated: any other variety, with sugar						
Carbonated: any other variety, dietetic						
Fruit Juices: apple						
Fruit Juices: coconut milk						
Fruit Juices: cranberry						
Fruit Juices: grapefruit						
Fruit Juices: grape						
Fruit Juices: lemonade						
Fruit Juices: orange						
Fruit Juices: pineapple						
Fruit Juices: prune						
Vegetable Juices: carrot						
Vegetable Juices: tomato						
Vegetable Juices: V-8 like						

9	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY / NEVER
Instant Mixes: kool-aid type						
Instant Mixes: tang type						
Other Alcoholic, Carbonated, Fruit, Vegetable, Instant Beverage Drunk at least Monthly						
[please identify]						
[please identify]						
[please identify]						
SNACKS AND DESSERTS						
Candy: any caramel type						
Candy: any chocolate type						
Candy: any hard type						
Candy: any jelly type						
Chewing gum: any type with sugar						
Chewing gum: any non-sugar type						
Pies: any cream type						
Pies: any fruit type						
Pies: any nut type						
Pies: any pumpkin type						
Puddings: any custard type						
Puddings: any rice type						
Puddings: any tapioca type						
Puddings: any jello type dessert						
Miscellaneous sweets: fruit cocktail						
Miscellaneous sweets: popsickles						
Chips: any cheese type						
Chips: any corn type						
Chips: any potato type						
Crackers: any cheese type						
Crackers: any Graham cracker type						
Crackers: any ritz/wheat thin/triscuit type						
Crackers: any saltine [soda] type						
Pretzels: any type						
Miscellaneous non-sweet snacks: onion rings						
Miscellaneous non-sweet snacks: popcorn						
Other Sweet or Non-Sweet Snacks Consumed at Least Monthly						
[please identify]						
[please identify]						
[please identify]						

10

CONDIMENTS AND FLAVORING AGENTS	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY / NEVER
Dried herbs/spices: leaves [any variety]						
Dried herbs/spices: seeds [any variety]						
MSG						
Pepper: black						
Pepper: red [chili-pepper types]						
Salt: not iodized						
Salt: iodized						
Salt: flavored types [garlic salt, etc.]						
Ice cream toppings [any variety]						
Jams: any variety						
Jellies: any variety						
Syrups: pancake fruit/maple types						
Syrups: sorghum [molasses]						
Barbecue sauce: any variety						
Catsup: any variety						
Cheese: grated, shake-on-types						
Chili sauce: chunky-salsa types						
Chili sauce: Tabasco/Louisiana hot types						
Horseradish						
Mustard						
Peanut butter: chunky/smooth types						
Pickles: relish forms						
Pickles: whole or chips [dill]						
Pickles: whole or chips [sweet]						
Soy sauce						
Tahina [sesame paste]						
Tartar sauce						
Teriyaki sauce						
Vinegar						
Worcestershire sauce						
Other Condiments and Flavoring Agents Consumed at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						

11 SUGAR AND SWEETENING AGENTS	TYPICAL SERVING SIZE	FREQUENCY				
		DAILY	WEEKLY	MONTHLY	YEARLY	RARELY C NEVER
Honey [any form]						
Sugar: brown						
Sugar: powdered/granulated forms						
Sugar substitute: saccharin						
Sugar substitute: any other form						
Other Sugar or Sweetening Agents Consumed at Least Monthly						
[please identify] _____						
[please identify] _____						
[please identify] _____						

APPENDIX G

WEIGHT CONTROL SURVEY

APPENDIX G

WEIGHT CONTROL SURVEY

Instructions

Do not write your name on this questionnaire. Answer questions honestly. If you need to understand a question, please ask for help.

Personal Backround

1. Type of subject: ____ Dancer
   ____ Non-dancer

2. How old are you? ____ years and ____ months.

3. What is your race? (Check One)

   ____ White
   ____ Black
   ____ Hispanic
   ____ Oriental
   ____ Other (describe)_____

4. What is your marital status? (Check One)

   ____ Never Married
   ____ Married
   ____ Separated or divorced
   ____ Widowed

5. How tall are you? ____ feet and ____ inches.

6. How much do you weigh? ____ pounds.

7. What do you think about your weight?

   ____ I am more than 10 pounds underweight.
   ____ I am 5 to 10 pounds underweight.
   ____ I am just about the right weight.
   ____ I am 5 to 10 pounds overweight.
   ____ I am more than 10 pounds overweight.

8. Please indicate whether you have had any of these illnesses for six months or more at any time during your life. (Check all that apply)

   ____ Diabetes
   ____ Asthma

_____ Monomucleosis (Mono)
_____ Anemia (low blood count)
_____ Stomach or bowel problems
_____ Epilepsy
_____ Allergies
_____ Other (describe)_____
_____

9. What is the most you ever weighed?

_____ pounds.

10. Do you worry about your weight? (Check one)

_____ Almost never
_____ Once in a while
_____ Often
_____ Almost always

11. During the season while you <u>are actually in rehearsals</u> for dance, does your weight go up or down often? (Check One)

_____ Yes, if I am not careful, I gain weight.
_____ Yes, if I am not careful, I lose weight.
_____ No, I stay at about the same weight without much effort.

12. During the off-season while you <u>are not rehearsing</u> for dance, does your weight go up or down often? (Check One)

_____ Yes, if I am not careful, I gain weight.
_____ Yes, if I am not careful, I lose weight.
_____ No, I stay at about the same weight without much effort.

13. During the off-season, are you usually involved in the following? (Check all that apply)

_____ Dance classes
_____ Rehearsals for a different production involving dance.
_____ I dance on my own.
_____ I am involved in a physical activity other

than dance.
_____ I am not involved in any physical activity.

14. How often do you go on eating binges? Binging means eating so much that you feel physically uncomfortable. When people binge, they are eating out of control (for example, eating a half-gallon of ice cream at on time). (Check one)

_____ Never
_____ Less than once a week
_____ More than once a week
_____ Almost every day

15. In the past year has anyone told you that you are underweight?

_____ Yes
_____ No (if no, skip to question 17.)

16. Who told you that you are underweight? (Check all that apply)

_____ Dance teacher/Director Fellow dancer
_____ Friend, other than a dancer.
_____ Parent (or step-parent or foster parent)
_____ Husband or wife
_____ Sister or brother (or step-sister or step-brother)
_____ Doctor
_____ Your child(or step-child or foster child)
_____ Other (describe)_____

17. In the past year, has anyone told you that you are overweight?

_____ Yes
_____ No (if no, skip to Question 19.)

18. Who told you that you are overweight? (Check all that apply)

_____ Dance teacher/Director
_____ Fellow Dancer
_____ Friend, other than a dancer.
_____ Parent (or step-parent of foster parent)
_____ Husband or wife
_____ Doctor
_____ Your child (or step-child or foster child)
_____ Other (describe)_____

19. In the past year, have you tried to lose weight?

_____ Yes
_____ No (if no, skip to Question 21.)

20. Why did you want to lose weight? (Check all that apply)

_____ To look better
_____ To improve my health
_____ To perform better in dance
_____ To get or keep a role in dance company
_____ To get smaller muscles
_____ To please or satisfy other people
_____ Some other reason (describe)_____

21. In the past year, have you tried to gain weight?

_____ Yes
_____ No (If no, skip to question 23.)

22. Why did you want to gain weight? (Check all that apply)

_____ To look better
_____ To improve my health
_____ To perform better in dance
_____ To get or keep a role in dance company
_____ To get stronger
_____ To get bigger muscles
_____ To please or satisfy other people

____ Some other reason (describe)_____

Have you ever had a menstrual period?

____Yes
____ No (if no, skip to Question 34.)

24. How old were you when you had your first menstrual period?

____ years and
____ months

25. Are your menstrual periods: (Check one)

____ Regular (about the same number of days between periods)
____ Unpredictable
____ Haven't had enough periods to tell yet. (if you checked this box, skip to question 33.)

26. Do your menstrual periods usually occur (Check one)

____ Every 2-3 weeks
____ About once a month
____ Every 5-7 weeks
____ More than 2 month between periods.

27. Do you usually gain weight during the two weeks just before your period starts?

____ Yes
____ No (if no, skip to Question 29.)

28. How much weight do you usually gain during the two weeks just before you period starts?

____ 1-2 pounds
____ 3-5 pounds
____ 6-9 pounds
____ 10 or more pounds

29. Do your eating habits change during the two weeks just before your period starts?

____ No (if no, skip to Question 31.)

____ Yes, I eat less
____ Yes, I eat more

30. Depending on your answer to Question 29., Which types of food do you eat less, or more. (Check all that apply)

____ Breads and cereals
____ Sugar and sweets
____ Meat
____ Dairy products
____ Butter and fats

31. How do you feel about yourself during the two weeks just before your period starts?

____ I feel the same as usual
____ I feel thinner or lighter than usual
____ I feel fatter or heavier than usual

32. After several months of having menstrual periods, have your periods ever stopped occurring (for reasons other than pregnancy, menopause, or hysterectomy)?

____ Yes
____ No (if no, skip to Question 35.)

33. How old were you when your periods stopped occurring? (Most recently)?
____ years and
____ months.

34. Why do you think your periods stopped occurring? (Check all that apply)

____ Dancing
____ Exercise
____ Underweight
____ Overweight
____ Other
(describe)_____

35. Are you presently using any form of birth control pills?

____ Yes
____ No (if no, skip to Question 38.)

36. How long have you been taking birth control pills?

____ less than 6 months
____ 6 months to 1 year

____ 1-2 years
____ 2-5 years
____ 5-10 years
____ over 10 years

37. Do you feel birth control pills affect your performance as a dancer?

____ Yes, I perform better
____ Yes, I perform worse
____ No, they have no affect on my performance.

DANCE BACKROUND. The next four questions are about the one dance teacher/director who influences you the most.

38. Is your teacher/director a man or a woman? (the one who influences you the most)

____ Man
____ Woman

39. About how old is your teacher/director?

____ less than 30 years old
____ 30-50 years old
____ More than 50 years old
____ Don't know

40. Is your teacher/director concerned about how much dancers should weigh? (Check one)

____ Yes, for all the dancers
____ Yes, but only for the best dancers
____ Yes, but only for the poorest dancers
____ Yes, but only for the dancers who have weight problems.
____ No
____ Don't Know

41. Is your teacher/director strict about how much dancers should weigh? For example, does he/she say how much you should weigh?

____ Yes, for all the dancers
____ Yes, but only for the best dancers
____ Yes, but only for the

poorest dancers
____ Yes, but only for the dancers who have weight problems
____ No
____ Don't Know

FAMILY BACKROUND

42. In your opinion, are any of your BLOOD RELATIVES very overweight? An example of a blood relative is a natural or biological parent instead of a step-parent.

____ Yes
____ No (if no, skip to Question 44.)
____ I don't know any of my blood relatives. (if you checked this box, skip to Question 46.)

43. In dicate which BLOOD RELATIVES you think are very overweight. (Check all that apply)

____ Sister or brother
____ Mother
____ Father
____ Grandparent
____ Aunt
____ Uncle
____ Your child

44. In your opinion, are any of your BLOOD RELATIVES very underweight?

____ Yes
____ No (If no, skip to Question 46.)

45. Indicate which BLOOD RELATIVES you think are very underweight. (Check all that apply)

____ Sister or brother
____ Mother
____ Father
____ Grandparent
____ Aunt
____ Uncle
____ Your child

46. How are the following persons concerned about your weight? (Check all that apply)

	Parent	Other Family Member	Friends	Dance Teacher/ Director	Fellow Dancer	Spouse or Mate
Tease me about my weight....	_____	_____	_____	_____	_____	_____
Remind me about my weight (negative)	_____	_____	_____	_____	_____	_____
Remind me about my weight (positive)	_____	_____	_____	_____	_____	_____
Help me to develop a plan for weight control...	_____	_____	_____	_____	_____	_____
Help me to control the amount of food I eat	_____	_____	_____	_____	_____	_____
Prepare or cook foods which are good for me	_____	_____	_____	_____	_____	_____
Give me information about weight control...	_____	_____	_____	_____	_____	_____

Thank you for answering the questions in the first part of this questionnaire honestly. If you have NEVER TRIED WEIGHT LOSS OR WEIGHT GAIN METHODS, you have finished the questionnaire.

If you have tried to LOSE WEIGHT OR TRIED TO MAINTAIN WEIGHT WITH WEIGHT LOSS METHODS, please answer the questions in the second part of this questionnaire. (Page 18.)

If you have tried to GAIN WEIGHT OR TRIED TO MAINTAIN WEIGHT WITH WEIGHT GAIN METHODS, please answer the questions in the third part of this questionnaire. (Page 29.)

WEIGHT CONTROL SURVEY
PART II

Questions About Losing Weight

Before you answer the questions in Part Two, tear off Page 37 of this questionnaire. This page has information which will help you to answer the questions in Part Two.

47. Indicate if you have tried any of the following methods of losing or maintaining weight.

	Never tried	Tried and lost or maintained weight	Tried but didn't lose or maintain weight
Exercising more.....	_____	_____	_____
Cutting down on snacks.....	_____	_____	_____
Cutting down on junk food.....	_____	_____	_____
Skipping meals more than once or twice a week.....	_____	_____	_____
Eating smaller meals without counting calories.....	_____	_____	_____
Using low-calorie or diet foods and drinks.....	_____	_____	_____
Using special diets which involve eating mostly one kind of food, such as grapefruit or high protein diets.....	_____	_____	_____
Counting calories.....	_____	_____	_____
Drinking less water or other liquids.....	_____	_____	_____
Using sauna or steambaths.....	_____	_____	_____
Fasting.....	_____	_____	_____
Spitting.....	_____	_____	_____
Using diet pills.....	_____	_____	_____
Using diuretic pills.....	_____	_____	_____

Using laxatives....._____ _____ _____

Vomiting....._____ _____ _____
Other_____....._____ _____ _____

48. If you have tried any of these methods of losing or maintaining weight, indicate whether it helped or hurt your dance performance. (Skip any method which you have not tried)

	Helped performance	Hurt performance	Didn't affect performance
Exercising more.....	_____	_____	_____
Cutting down on snacks...	_____	_____	_____
Cutting down on junk food	_____	_____	_____
Skipping meals more than once or twice a week.....	_____	_____	_____
Eating smaller meals with outcounting calories.....	_____	_____	_____
Using low-calorie or diet foods and drinks.....	_____	_____	_____
Using special diets which involve eating mostly one kind of food, such as grapefruit or high protein diets.....	_____	_____	_____
Counting calories.....	_____	_____	_____
Drinking less water or other liquids.....	_____	_____	_____
Using sauna or steambaths	_____	_____	_____
Fasting.....	_____	_____	_____
Spitting.....	_____	_____	_____
Using diet pills.....	_____	_____	_____
Using diuretic pills.....	_____	_____	_____
Using laxatives.....	_____	_____	_____
Vomiting.....	_____	_____	_____
Other_____.	_____	_____	_____

49. Binging - Answer parts a through c of this question if you ever go on eating binges. Binging means eating so much that you feel physically uncomfortable. When people binge, they are eating out of control (for example, eating a half-gallon of ice cream at one time). If you never go on eating binges, skip to Question 50.

a. How often do you go on eating binges? (Check one)

____ Less than once a week
____ More than once a week
____ Almost every day

b. After a binge, how often do you make yourself vomit? (Check one)

____ Never vomit
____ After only a few binges
____ After about half of the binges
____ After most binges

c. After binging, do you usually increase your exercise level?

____ Yes
____ No

50. Dancing More - If you have ever tried dancing more to lose or maintain weight, please indicate how you danced more (Check all that apply). If you never tried this method of weight loss, go to Question 51.

____ Increase the amount of time you dance each day
____ Increase the number of days you dance each week
____ Increase the intensity of dancing which you do (work harder when you dance)
____ Increase the amount of dancing or the number of repetitions you usually do for each exercise.
____ Add different idioms of dance

51. Skipping Meals - Answer parts a through d of this question if you have ever tried skipping meals to lose or maintain weight. If you never tried this method of weight

loss, go to Question 52.

a. When you try to lose or maintain weight, how many days a week do you usually skip meals? (Check one)

____ one
____ two
____ three
____ four
____ five
____ six
____ seven

b. When you try to lose ar maintain weight, how many meals do you usually skip each day? (Check one)

____ one
____ two
____ three
____ other_____

c. When you try to lose or maintain weight, which meal do you skip most often? (Check all that apply)

____ Snacks
____ Breakfast
____ Lunch
____ Dinner

d. How old were you when you started to skip meals to lose or maintain weight?
____ years old.

52. Using Special Diets - answer parts a through d of this question if you have ever tried special diets to lose or maintain weight. If you have never tried this method of weight loss, skip to Question 54.

a. Describe the special diet(s) which you have used:

Types of Foods Used

_____

_____

b. When you try to lose or maintain weight, how many days a week do you usually use this special diet? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six

____ Seven

c. What is the longest number of consecutive days a week do you usually use this special diet?

____ days.

d. How old were you when you started to use special diets to lose or maintain weight? ____ years old.

53. Counting Calories - Answer parts a through d of this question if you have ever tried counting calories to lose or maintain weight. If you never tried this method, skip to question 54.

a. When you try to lose or maintain weight, how many calories do you usually eat each day? (Check the answer which is nearest to the correct number of calories)

____less than 500 ____500 ____750 ____1000 ____1250
____1500 ____1750 ____2000 ____2250 ____2500 ____2750
____3000 ____3250 ____3500 ____more than 3500

b. When you try to lose or maintain weight, how many days a week do you usually count calories? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

c. What is the longest number of consecutive days you have counted calories? ____ days.

d. How old were you when you started to count calories to lose or maintain weight? ____ years old.

54. Saunas or Steam Baths - Answer parts a through d of these question if you have ever tried saunas or steam baths to lose or maintain weight. If you never tried this method of weight loss, skip to question 55.

a. When you try to lose or maintain weight, how many days a week do you use a steam bath? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. Have you ever used a sauna or steam bath more than once a day? (Check one)

____ Yes, often
____ Yes, once or twice
____ No

c. How long are each of your saunas or steam baths? (Check one)

____ 10 minutes or less
____ 11-15 minutes
____ 16-20 minutes
____ More than 20 minutes

d. How old were you when you started to use saunas or steam baths to lose or maintain weight?

____ years old.

55. Fasting - Answer parts a through d of this question if you have ever tried fasting to lose or maintain weight. If you never tried this method of weight loss, skip to Question 57.

a. Which liquids do you usually drink when you are fasting? (Check all that apply)

____ Water
____ Fruit juices
____ Soft drinks or colas
____ Teas or coffee
____ Milk
____ Alcoholic Beverages
____ Other
(describe)_____

b. When you try to lose or maintain weight, how many days a week do you usually fast?

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

c. What is the longest number of consecutive days you have fasted? ____ days.

d. How old were you when you started to fast to lose or maintain weight? ____ years old.

56. Vomiting - Answer parts a through c of this question if you have ever tried vomiting to lose or maintain weight. If you never tried this method of weight loss, skip to Question 57.

a. When you try to lose or maintain weight, how many days do you usually make yourself vomit? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. Have you ever made yourself vomit more than once a day? (Check one)

____ Yes, often
____ Yes, once or twice
____ No

c. How old were you when you started to vomit to lose weight?
____ years old.

57. Laxatives - Answer parts a through d of this question if you have ever used laxatives to lose or maintain weight. If you never tried this method of weight loss, skip to Question 58.

a. When you try to lose or maintain weight, how many days a week do you usually use laxatives? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many laxatives do you take each day?

____ pills
____ teaspoonfuls
____ tablespoonfuls

c. What is the name of the laxative you use?_____

d. How old were you when you started using laxatives to lose or maintain weight?
____ years old.

58. Diuretic Pills - Answer parts a through d of this question if you have ever used diuretics to lose or maintain

weight. If you never tried this method of weight loss, skip to Question 59.

a. When you try to lose or maintain weight, how many days a week do you usually use diuretic pills? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many diuretic pills do you take each day?
____ pills.

c. What is the name of the diuretic pill that you use to lose or maintain weight?_____

d. How old were you when you started using diuretic pills?
____ years old.

59. Diet Pills - Answer parts a through d of this question if you have ever used diet pills to lose or maintain weight. If you never tried this method of weight loss, skip to Question 60.

a. When you try to lose or maintain weight, how many days a week do you usually use diet pills? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many diet pills do you take each day?
____ pills.

c. What is the name of the diet pills that you use to lose or maintain weight?_____

d. How old were you when you started using diet pills?
____ years old.

WEIGHT CONTROL

60. At what age did you start using weight loss methods?
____ years old.

61. What is the usual duration of your weight loss methods?

(Check one)

____ Less than one week
____ 1-2 weeks
____ 3-4 weeks
____ 1-6 months
____ More than six months

62. How often do you use weight loss methods? (Check one)

____ Once a year
____ Twice a year
____ 3-4 times a year
____ 5-6 times a year
____ Almost constantly

63. Did you ever continue to use weight loss methods because you were afraid that you would gain too much weight if you stopped?

____ Yes
____ No (if no, skip to Question 66.)

64. If you answered yes to Question 63, which weight loss method(s) did you use when you were afraid of gaining too much weight? (Check all that apply)

_____Exercising more
_____Cutting down on snacks
_____Cutting down on junk food
_____Skipping Meals
_____Eating smaller meals without counting calories
_____Using low-calorie or diet foods and drinks
_____Using special diets which involve eating mostly one kind
_____of food
_____Counting Calories
_____Drinking less water or other liquids
_____Using saunas or steam baths
_____fasting
_____Spitting
_____Using diet pills
_____Using diuretic pills
_____Using laxatives
_____Vomiting
_____Other (describe)_____

65. Were you ever afraid that you would lose too much weight if you continued to use weight loss methods?

_____Yes
_____No

66. Did you ever lose more weight than you wanted to lose?

_____Yes
_____No

67. Did you ever decide to lose a certain number of pounds and then change your mind and try to lose more than that amount?
_____Yes
_____No

68. Did you ever decide to lose a certain number of pounds, achieve your goal, and then gain most or all of the weight right back?
_____Yes
_____No

69. Have you ever been told that you have anorexia nervosa?
_____Yes
_____No

70. Have you ever been told that you have bulimia?
_____Yes
_____No

71. Did anyone tell you (or did you ever read) that diet pills, vomiting, laxatives, diuretic pills, fasting, or drinking less, are dangerous methods of losing weight?
_____Yes
_____No

72. If you wanted to lose weight at some time in the future, which weightloss methods would you use? (Check all that apply)
_____Safe
_____Dangerous

Thank you for answering the questions in Part Two of this questionnaire honestly. If you have ever TRIED TO GAIN WEIGHT OR MAINTAIN WEIGHT USING WEIGHT GAIN METHODS, please answer the questions in Part Three.

WEIGHT CONTROL SURVEY
PART III

Questions about Gaining Weight

Before you answer the questions in Part Three, tear off Page 38 of this questionnaire. This page has information which will help you to answer the questions in Part Three.

73. Indicate if you have ever tried any of these methods of gaining or maintaining weight. (Check one box in each row)

	Never tried	Tried and gained or maintained weight	Tried and didn't gain or maintain weight
Adding meals or snacks.....	_____	_____	_____
Eating larger meals without counting calories.....	_____	_____	_____

Using high-calorie or high-fat foods or drinks.....	_____	_____	_____
Using special diets which involve eating mostly one kind of food, such as high protein diets.....	_____	_____	_____
Counting calories.....	_____	_____	_____
Using liquid supplements such as Nutrament or Tiger's Milk...	_____	_____	_____
Using weight gain pills or other medications, such as Weight Gain Tablets.....	_____	_____	_____
Using anabolic steroids.....	_____	_____	_____
Using weight training for the purpose of gaining weight or body size.....	_____	_____	_____
Cutting back on the amount of exercise you do.....	_____	_____	_____
Other _____.....	_____	_____	_____

74. If you have tried any of these methods of gaining of maintaining weight, indicate whether it helped or hurt your performance in dance. (Skip any methods which you have not tried)

	Helped performance	Hurt performance	Didn't affect performance
Adding meals or snacks.....	_____	_____	_____
Eating larger meals without counting calories.....	_____	_____	_____
Using high-calorie or high-fat foods or drinks.....	_____	_____	_____
Using special diets which involve eating mostly one			

kind of food, such as high protein diets.....	_____	_____	_____
Counting calories.....	_____	_____	_____
Using liquid supplements such as Nutrament or Tiger's Milk...	_____	_____	_____
Using weight gain pills or other medications, such as Weight Gain Tablets.....	_____	_____	_____
Using anabolic steroids.....	_____	_____	_____
Using weight training for the purpose of gaining weight or body size.....	_____	_____	_____
Cutting back on the amount of exercise you do.....	_____	_____	_____
Other _____.....	_____	_____	_____

75. Using Special Diets - Answer parts a through d of this question if you have ever tried special diets to gain or maintain weight. If you never tried this method of weight gain, skip to Question 76.

a. Describe the special diet(s) which you have used:

Types of foods used

_____

_____

b. When you try to gain or maintain weight, how many days a week do you usually use this special diet? (Check one)

_____ One
_____ Two
_____ Three
_____ Four
_____ Five
_____ Six
_____ Seven

c. What is the longest number of consecutive days you have used this special diet? _____ days.

d. How old were you when you started to use special diets to gain or maintain weight? ____ years old.

77. Counting Calories - Answer parts a through d of this question if you have ever tried counting calories to gain or maintain weight. If you never tried this method of weight gain, skip to Question 78.

a. When you try to gain or maintain weight, how many calories do you usually eat each day? (Check the answer which is nearest to the correct number of calories)

____1000 ____1500 ____2000 ____3000 ____3500 ____4000

____4500 ____5000 ____5500 ____6000 ____over 6000

b. When you try to gain or maintain weight, how many days a week do you usually count calories to gain or maintain weight? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

c. What is the longest number of consecutive days you have counted calories to gain or maintain weight?
____ days.

d. How old were you when you started to count calories to gain or maintain weight? ____ years old.

78. Liquid Supplements - Answer parts a through d of this question if you have ever used liquid supplements such a Nutrament or Tiger's Milk to gain or maintain weight. If you never tried this method of weight gain, skip to Question 79.

a. When you try to gain or maintain weight, how many days a week do you usually use liquid supplements? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many liquid supplements do you take each day?
____cups

_____other (describe)

c. What is the name of the liquid supplement that you use to gain or maintain weight?

_____

d. How old were you when you started using liquid supplements to gain or maintain weight? ____years old

79. Food Supplements - Answer parts a through d of this question if you have ever used food supplements such as Mus-l-on or Protein Powder to gain or maintain weight. If you never tried this method of gaining weight, skip to Question 80.

a. When you try to gain or maintain weight, how many days a week do you usually use food supplements? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many food supplements do you usually take each day?

____ cups
____ teaspoonfuls
____ other

c. What is the name of the food supplement that you use to gain or maintain weight?

_____

d. How old were you when you started using food supplements to gain or maintain weight? ____ years old.

80. Weight Gain Pills or Medications - Answer parts a through d of this question if you have ever used weight gain pills or medications to gain or maintain weight. If you never tried this method of gaining weight, skip to Question 81.

a. When you try to gain or maintain weight, how many days a week do you usually use weight gain pills or medications? (Check one)

____ One
____ Two
____ Three
____ Four
____ Five
____ Six

____ Seven

b. How many weight gain pills or medications do you take each time?

____ pills
____ other (describe)

c. What is the name of the weight gain pills or medication that you use?

_____

d. How old were you when you started using weight gain pills or medications?

____ years old.

81. Anabolic Steroids - Answer parts a through d of this question if you have ever used anabolic steroids. If you never used anabolic steroids, skip to Question 82.

a. When you try to gain or maintain weight, how many days a week do you use anabolic steroids?

____ One
____ Two
____ Three
____ Four
____ Five
____ Six
____ Seven

b. How many anabolic steroids (pills, tablets, etc.) do you take each day?

____ pills
____ other (describe)

c. What is the name of the anabolic steroid that you use?

_____

d. How old were you when you started using anabolic steroids?

____ years old.

82. Weight Training to Gain Weight - Answer parts a and b of this question if you have ever tried weight training to gain or maintain weight. If you have never tried this method, skip to Question 83.

a. Do you do weight training when you are not trying to gain or maintain weight?

____ yes
____ no

b. If you use weight training to gain or maintain weight, do you: (Check all that apply)

____ Add new or different exercises to the weight training which you already do?

_____ Do more repeats of the same exercises which you already do?
_____ Lift heavier weights?

_____ Use weight training more days per week.

83. Cutting Back On Dance - If you have ever cut back on dancing to gain or maintain weight, please indicate how you cut back on dancing. (Check all that apply) If you have never tried this method, skip to Question 85.

_____ Cut back on the total amount of time you danced each day?
_____ Cut back on the number of days you danced each week?

_____ Cut back on the intensity of the dancing which you do (don't work as hard when you dance)?
_____ Cut back on the amount of dancing that you usually do?

84. Cutting Back On Exercise - If you have ever cut back on exercise to gain or maintain weight, please indicate how you cut back on exercise. (Check all that apply) If you have never tried this method, skip to Question 85.

_____ Cut back on the total amount of time you exercise each day?
_____ Cut back on the number of days you exercise each week?

_____ Cut back on the intensity of the exercise which you do (don't work as hard when you exercise)?
_____ Cut back on the amount of exercise that you usually do?

WEIGHT CONTROL

85. At what age did you start using weight gain methods?
_____ years old.

86. What is the usual duration of each of your weight gain methods?
_____ less than one week
_____ 1-2 weeks
_____ 3-4 weeks
_____ 1-6 months
_____ more than six months

87. How often do you use weight gain methods? (Check one)

_____ Once a year or less
_____ Twice a year
_____ Three or four times a year
_____ Five or six times a year
_____ Almost constantly

88. Did anyone tell you (or did you ever read) that weight gain pills, weight gain medicines, liquid supplements, food supplements, or anabolic steroids are dangerous methods of gaining weight?

_____ yes
_____ no

89. If you wanted to gain weight at some time in the future, which weight-gain methods would you use? (Check all that apply)

_____ Safe
_____ Dangerous

Thank you for answering the questions in Part Three of this questionnaire honestly.

Weight Control Survey

Tear this page off the questionnaire. Use the definitions on this page to help you answer the questions in Part Two and Part Three of this questionnaire.

DEFINITIONS

METHODS OF LOSING WEIGHT

Anorexia nervosa means being so afraid of gaining weight that you starve yourself or eat very little. Most people with anorexia nervosa are very thin.

Bulimia means several different things. It can mean eating until you cannot eat any more or until you feel very uncomfortable (such as eating a half-gallon of ice cream at one time). Bulimia can also mean overeating followed by vomiting to get rid of the food.

Diet pills mean pills such as Dexatrim, Prolamine, Acutrim, Dex-a-diet, Dietcap, Dietac, or Slim-fast which you can buy at a drugstore or grocery store.

Diuretics mean pills which make you lose water by urinating (peeing, pissing). Examples are Diurex, Aqua-ban, Odrinal, Diuril, or Hydro Tabs.

Fasting means eating no food for a day or more at a time. People who fast usually drink water or juice.

Laxatives are pills, tablets, or liquids such as Correctol, Ex Lax, Feen-a-mint, Nature's Remedy, Dulcolax, or Milk of Magnesia which make you lose food by defecating (shitting, having a bowel movement).

METHODS OF GAINING WEIGHT

Anabolic steroids are drugs such as Dianabol which are supposed to help you gain muscle size. Anabolic steroids are usually prescription drugs.

Food supplements refer to products such as Mus-l-on, Naturade Protein Powder, Naturade Muscle Builder, or Body Plus Weight Gain Formula which are supposed to help you gain weight.

Liquid supplements mean special drinks such as Nutrament, Nutracal, Dynamite Milk Shake, Tiger's Milk, or Ensure Liquid Supplement which are supposed to help you gain weight.

Weight gain pills or other medications refer to medicine-like products sold as pills, tablets, or liquids. Examples are Joe Weider's Crash Weight Gain Tablets or Joe Weider's Anabolic Mega-Paks.

LIST OF REFERENCES

LIST OF REFERENCES

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