ANALYSIS OF SOME PROBLEMS ENCOUNTERED IN DEVELOPING NEW POULTRY PRODUCTS

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ABSTRACT

ANALYSIS OF SOME PROBLEMS ENCOUNTERED
IN DEVELOPING NEW POULTRY PRODUCTS

by

Julius Frank Bauermann

Compelling reasons are at hand for continued new product development. More than 200 poultry and/or egg products have appeared on the market as fully developed, yet a large majority of them have experienced limited sales or have been withdrawn. Extensive research on poultry and egg product development has been conducted by several universities, but little of it has been utilized by the industry. The purpose of this study is to analyze poultry-product development and the problems associated with such development, particularly in relation to small firms as defined by the U. S. Small Business Administration.

In-depth case studies of two small USDA inspected manufacturers of further-processed poultry products were made. Personal interviews of key management personnel were conducted to determine attitudes and philosophies towards product development. For further assessment of management's insight into marketing procedures, selected products from each firm were consumer tested to solve a particular problem that management believed important. The reactions to and comprehension by the firm of the consumer tests were analyzed and discussed.
A review of product development considerations based on a

literature review and the author's fifteen years' experience of working in and with the industry was employed in the data analysis.

Results of the study showed that small further-processing firms depend heavily on brokers for marketing advice, sales and distribution of their newly-developed products. The majority of new product ideas came to the further processor from outside sources. Brokers were most important although buyers and ingredient/additive suppliers were also considered helpful.

Suppliers were frequent sources of services to the firms (in the study). Among the service areas involved were technology in relation to food additives, engineering, flavorings, and particularly packaging and services related to packaging.

Quality control on finished products, when practiced, was very cursory. Raw ingredients and other materials specifications were not used. In part this was due to management's lack of appreciation for quality control and in part due to the failure of management to comprehend the quality control results if and when obtained.

Various methods were used by the firm's managements to estimate costs of new products. Although they may not have been true costs, they were sufficiently accurate to permit initial marketing or related decisions.

The results indicated that the firms did not carry out formal market testing programs. As with quality control, the inability of management to plan, execute, or comprehend a marketing study was one major reason. Brokers often provided management with substantial and highly respected, by the firm, aid in this area.

The study further brought out that advertising was used sparingly

and that certain forms of advertising were of little value to the small firm, especially television and most other forms of retail advertising.

A consumer panel showed:

1. an overwhelming preference for an eight-ounce capacity plastic cup with plastic lid as projecting a "salad image" and being more convenient to use than an eight-ounce capacity aluminum cup with aluminum lid.

2. a strong liking for a commercially developed chicken salad and a dislike for a chicken salad developed by a university.

3. among those not expressing a dislike for chicken, that the value of a commercial frozen 2-lb. cream-style gravy and sliced chicken to be less than 75¢; and a new competitive frozen chicken parts and gravy to be more than 75¢ in value.

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BY

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CHAPTER I

INTRODUCTION

Situational Analysis

Interest in new product development has increased markedly in recent years. The number and kind of items on store shelves has changed nearly fifty percent in the last decade. A number of reasons for these changes can be cited, such as changing consumer behavior, increased purchasing power, and the rapid technological advances experienced in recent years. For some processors, new products have been added to make more efficient use of manpower and facilities, for others to provide a hedge against seasonal fluctuations in their basic business, and still others to complement existing products or to convert by-products into greater economic value. Perhaps one of the most basic reasons for adding new food products has been that each food processor is doing his best to maintain his share, or to get a larger share, of the consumer food dollar.

Some impressive obstacles against success of new products are known. For example, Angelus (1970) reported that in 1968, 10,000 new items were introduced in supermarkets and that of these 8,000 failed. Of the latter number 7,000 were in regional distribution and 1,000 were in national distribution. A. C. Neilsen & Co. (1969) is quoted as

stating that "out of every 100 items submitted to grocery store buyers, 23 are accepted." Angelus (1970) studied seventy-five product failures in detail. About half of them were food products and all were national brands. He listed six reasons for their failures:

1. Insignificant consumer difference to other products
2. Poor product positioning (Positioning is its market position or place in the market, not shelf allocation.)
3. No point of difference (me-tooism) between products
4. Bad timing of introduction
5. Poor product performance for consumer
6. Wrong market for company

A generally accepted figure for successful new products on the market, based on those introduced, is twenty percent.

In spite of the foregoing discouraging factors, compelling reasons for continued new product development can be found. Goodman (1970) cited an average product life cycle of only 2.9 years. Thus, a firm must develop products just to keep itself "alive". A. C. Neilsen & Co. (1969) reported that annual sales gains can be traced to new products. Their statistics of established products measured show that in the latest 12-month period these products accounted for $57 billion in sales, about equal to the volume of the previous year. New products, however, accounted for almost $8 billion additional sales, or 12.2 percent of the year's total business. A. C. Neilsen & Co. have also reported (Anon., 1967) that 12.2 percent of the dollar value of food items measured during October and November, 1966, was from products on the market less than a year.

The USDA Poultry Slaughter Reports for the past decade show that the amount of turkeys and chickens used for further processing has increased each year. There has been a three-fold increase in pounds

of turkeys and a one-third increase in pounds of chickens used for further processing. Both of these increases took place while the pounds of turkeys slaughtered increased by sixty-five percent and chickens by eighty-nine percent. More than 200 poultry and/or egg products have appeared on the market as fully developed over the last decade, yet a large majority of them have experienced limited sales or have been withdrawn from the market. A number of poultry products have been developed by university personnel, taste panel tested, and even test marketed (Reid, Baker, Darrah, 1960; Reid, et. al., 1960a, 1960b; Reid and Darrah, 1960; Marshall, 1960, 1961; Reid, Baker, Darrah, 1961; Reid and Darrah, 1961; Marshall, 1962a, 1962b, 1963a, 1963b; Jack, 1964; Darfler and Jack, 1964; PENB, 1964; Margolf, 1964; Marshall, 1964; Stiles and Froning, 1964a, 1964b; Jack, Darfler, and Stratton, 1965; Baker, et. al., 1966; Baker, et. al., 1967; Baker, et. al., 1967a, 1967b; and MacNeil, 1967); but few, if any, have succeeded commercially. Reasons cited by poultry processors during personal interviews by the author, for not using these products, have been, (1) actual sales of the products were at odds with those reported by the limited market tests performed on the products, (2) a fear of a firm with greater marketing/financial power usurping the market after it has been developed by a lesser firm, (3) inability to commercialize production and economically produce the products, and (4) product costs exceeding competitive product costs by a wide margin.

The National Commission on Food Marketing (1966) reported that census concentration ratios in the poultry processing industry have

been low compared with other food manufacturing. These firms spent less than one-half of one percent of their total sales on new product development. Using data from the USDA on Federally inspected plants, the Commission report showed concentration had increased in chicken slaughtering and virtually no change had taken place in the concentration ratios of turkey slaughterers over a five year period. The studies in this instance were referring to what the trade calls "dressing plants" (those which slaughter and cut up chickens and turkeys to the point of being ready-to-cook) as compared to "further processors." The latter are highly concentrated according to the Commission and tend to be specialized in what they produce and how they produce. With little product differentiation, extreme cyclical periods of depressed and high prices, overall low margins, more mergers and increased vertical integration took place in the late 60's. As a result of all these factors, new product development has increased noticeably. Substantial problems have arisen for both small and large firms as they take on new products, firm expansion, and overall growth in the industry.

Purpose of Study

The purpose of this study was to analyze poultry-product development and some of the problems associated with such development.

Organization of Study

The study is organized in the following manner. A situational analysis of poultry and egg products is provided in Chapter I. Chapter II provides a review of product-development considerations

based on a literature review and the writer's own experience working in and with the industry for fifteen years. Chapter III describes two firms studied, their product-development capabilities, experience, market-testing program, quality standards, advertising, packaging and distribution. Cost data obtained for selected products made by each firm are included in Chapter III. Each firm was asked to select a problem associated with one or more of its leading products which might lend itself to solution through market testing in the form of a consumer panel. The products selected, questions asked, and results are given in Chapter IV. Chapter V discusses and further analyzes data contained in the previous two chapters. Finally, in Chapter VI the results are summarized. In addition to specific references cited in the literature review, a list of general references is provided following the last chapter. A systematic checklist for product development is made available as an appendix. The major subjects covered in this check-list are:

1. New Product Sources
2. Evaluation of Products
3. Quality Control
4. Advertising and Promotion
5. Legal

CHAPTER II

PRODUCT DEVELOPMENT CONSIDERATIONS

New Products

A new product can usually be classified into one of three types. The first type is the most glamorous and spectacular, namely the innovations. These are truly the new product, in that they did not exist before.

A second type is one which might be labeled adaptations. These are products which are new in one sense, but old in that they are a different form of an already existing product. Included in this group are the "improved" products. The "improvement" may be only in ease of opening the package.

A third classification is the group of products known as imitations. This grouping may be further broken down into three sub-classes. The first is that of duplicates in which the new product is really a carbon copy of one previously marketed. The second sub-class is the substitutes, in which the new product is a different type of food, but which can be readily substituted for an existing food product. An example of this category is the use of soft-drinks in place of milk and fruit juices. The third sub-class is synthetics. Into this class fall such new products as those which are made from an entirely different ingredient source, but in which the finished product is used

identically as a product currently on the market. An example of this is the use of soybean (vegetable) protein meats for animal protein meats.

It is quite possible for a product to fall into more than one category. For example, an adaptation of a product may well make it substitutable for another, whereas in its original state it may not be. Liquid milk would be unsuitable for use in hot-dog manufacture, but by drying it into non-fat dry milk powder (an adaptation), it becomes very useful as a substitute for other protein additives in hot-dog manufacture.

Wasson (1960) provided a list of thirteen ways a product can be new. The positive factors are:

1. New cost
2. New convenience
3. New performance
4. New availability
5. Conspicuousness
6. Easy credibility

Those which might slow up market development and make it more costly and difficult are:

7. New method of use
8. Unfamiliar patterns of use
9. Unfamiliar benefit
10. Costliness (either fancied or real)

Those which have an ambivalent effect in that they seem to exert neither a positive nor a negative effect are:

11. New appearance
12. Different accompanying or implied services
13. New market

A fourteenth item (new construction or composition) was listed but not actually included because Wasson felt it had no consumer meaning.

The Role of Quality in Product Development

Both firm size and attitude seem to have a great deal of bearing on quality in relation to product development. Competition, of course, also directs the relationship of quality to product development. A small firm tends to look upon quality in terms of providing a "good-sized portion" or a "generous quantity of meat" in a TV dinner or meat pie. The large firm looks at quality in the sense that its food product has high microbiological and nutritional standards and that the ingredients are all tested and are not contaminated or second-rate in any way. Using its cost controls, market research analyses, and microbiological tests, the large firm does not provide what it claims to be the oversized portions and less wholesome product offered by small firms.

Competition also plays a role in quality of product development according to Grieg (1964). The type of competition and the intensity of it will frequently force a firm (or it may do so voluntarily) to differentiate the quality of its product in order to remain or even become competitive. It is always possible to sell a product for a lower price than an identical competing one by reducing the quality and/or quantity of ingredients. This is fairly obvious as in decreasing the meat content and increasing the gravy content of a frozen chicken pie. Or it could be more subtle in which the basic difference between two seemingly identical cake mixes is that one already contains powdered egg, and the other requires an egg to be added to the mix at the time of preparation in the home. One cake mix reflects the price of powdered eggs in its cost structure, whereas

the cheaper one, with fewer ingredients, provides a lower shelf price.

A standard-of-identity established for a product can severely restrict some aspects of qualitative competition by controlling the number, amount and kind of ingredients used in that product. In situations such as these, other qualitative characteristics can be used to create real or imagined differences in quality between products. Among these are color, shape, design, packaging, grade, services, and graphics. Generally these qualitative characteristics come into play in mature product areas rather than in new products. Advertising and promotion campaigns can bring about imagined quality differences, for example, a brand name over a generic version of the same product. A packaging concept can also be used to create imagined quality differences. It is nearly impossible for a new firm to overcome obstacles of this type and still capture any sizable share of the market. Even if the obstacles are overcome, returns are likely to be quite low.

Grieg (1966) stated that qualitative competition can be broken down on the basis of vertical, horizontal, and innovational competition among the firms. Vertical competition means superior quality between one of two products which consumers consider worth the cost. An example might be high-meat-content chicken pie vs. the common low-cost low-meat-content 8-oz. chicken pie. In horizontal competition cost difference is not important and qualities are ranked in different order by consumers. Breads serve as a good example in this instance. Innovational quality competition signifies that changes in the product are considered an improvement in the product by most people; and, although usually involved, a cost increase is not mandatory. An often-cited example of this type is that of hydrogenated vegetable

oils vs. lard.

Economic Considerations

In developing any new product, one must make a volume-cost-profit analysis of the product early in its developmental stage. Among the desirable estimates are the minimum volume required to avoid a loss, the volume necessary to reach a desired profit objective, and the probable profit or loss at various output ranges. If the firm is well established, losses might be sustained for some period of time before "the corner is turned" and profits begin to accrue. For a firm just starting, profits and that "corner" might have to be immediate.

Costs are generally classified according to one of three types (Keller and Ferrara, 1966; Smith and Cooper, 1967). Fixed costs are those which do not vary with volume of product. Among these would be those concerned with rent, depreciation, insurance, and part of the labor costs. Semi-fixed costs are those which vary with volume but not in direct proportions with the increases or decreases. A typical example in this category is maintenance costs. The last classification is that of variable costs. These costs will vary with the volume of the goods produced. Examples include labor cost, raw ingredients, storage, and warehousing. Obviously, the classification of the costs given are dependent upon the time interval being considered. Therefore, it must be realized that for some decisions a cost might be fixed and classed as variable in other decisions.

Developmental costs also receive special consideration. If the product is one which is being added to an already established line and the plant is operating below capacity, certain fixed costs may not

have to be considered in determining the total cost of the new product. If plant capacity is exceeded eventually as a result of the new product, the product cost will have to be re-estimated on this basis.

External economic factors should also be taken into account when developing a new product. Periods of prosperity or depression can affect sales of a product, since the product may not be compatible with declining incomes or expected consumer expenditures. The demographic structure of the market must be related to the product as well. For example, it should be known that a product geared toward consumers with a great deal of leisure time may be because of retirement status and not because of high income.

Sociological and Ecological Considerations

Some firms believe they have consumer sociological considerations to take into account when developing a new product. Some of these are closely tied to economic factors, for example, shifting of expenditure priorities by retiring consumers. Labor conditions may seriously affect the costs if the product has substantial hand labor involved in its manufacturing. High unemployment may provide a plentiful work force and lower wages, whereas the opposite may be true if unemployment is low. A product which requires sophisticated processing in manufacture will require skilled operators with adequate education. A history of labor unrest in a given area may preclude the development of a product that is perishable to a great degree or one that cannot be stored for indefinite periods.

In the last few years, a number of manufacturers have had to abandon a product or its continued development because the

manufacturing process was ecologically unacceptable. Sewage load was too high to permit economical processing of waste from the product. Air pollution from smoking products or possible carcinogenic activity of natural smoke might preclude installation of a smokehouse for a new smoked product. Hence, management has to decide whether capital equipment, if not already on hand, is worth the risk.

Legal Considerations

Today legal considerations have assumed a very dominant role in the food-processing business. Many firms now seek corporate identity through the use of a trademark or logo, or both, to tie in all of their products, particularly if they are diversified. When the firm expects to grow and expand its sales territories, it is very important that this trademark or logo be registered either in the U. S. Patent Office or in the appropriate state office when only intrastate protection is desired. If the firm chooses not to protect itself in this manner, then some day it may find itself competing with a product of the same name, design, form, etc., but of cheaper quality. Consumers will not be able to detect the subtle difference in manufacturers, and the firm originally making the product will suffer and have no recourse for punitive action against its competitor.

Patents can be particularly valuable to a firm engaged in new product development when the product contains something that is patentable. A particular type of machinery, a particular type of a process possibly using this special machine, a breakthrough in chemistry related to the product's formulation, anything of this type is desirable to have patented. On the other hand, something added to

the product to change its characteristic slightly (a recipe, a method of handling it) is seldom patentable or worth patenting.

Heightened consumer activity and militancy in recent years along with a number of new laws and regulations, as well as some strengthened old ones, have had a profound effect on new products. Labels, package size, graphics, ingredients, and even composition or formulation of products are closely regulated. In the particular case of poultry and egg products, the number of standard-of-identity products is increasing through formal written regulation and in an unwritten form enforced by disapproval of labels unless the product conforms to the "unwritten" standard-of-identity. This type of activity has a curtailing effect on new product development because of restrictions limiting ingredients or use of new, but non-standard components; or simply, as Schon (1967) pointed out, fear of innovation often causes resistance to implementation. Depew (1969) pointed out that laws and regulations designed to curb economic dishonesty in the 1930's, if applied now, would actually lower quality of foods and restrict new product development.

Labor regulations which call for minimum wages, safety requirements, protection around certain types of machines and union contracts can stimulate or retard new product development. Usually stimulation is because of economic considerations, be it higher production rates, continuous processing to reduce the number of employees required over batch processing, or to simplify manufacturing.

Marketing Considerations

Before any new product is marketed, substantial market research should be performed. The behavior of consumers and their attitudes

towards new products must be carefully evaluated. There are a great many ways of doing this, and numerous studies and critiques are in the literature. Those by Marquardt (1964), Angell (1967 and 1968), and Ellis (1967 and 1970) are illustrative for food products, and the reader is referred to the list of general references for additional articles. No one method should be considered best for any given product or situation.

One way of approaching consumer-behavior marketing research is by checking consumers' activities, wants, customs, habits, and tastes.

> Activities-- Such areas as leisure time in terms of what is received from retirement as well as that due to vacations and similar recreation-leisure trends must be evaluated.
>
> Wants-- For new products it is important to determine if the product fills a consumer need, if that need has gone unrecognized in the past, or if a competing product has already fulfilled it, and if the need must be created to sell the product to the consumer.
>
> Custom-- Lowenberg (1970) reviewed the socio-cultural basis of food habits, particularly in underdeveloped countries. She pointed out that higher cultural habits provide more daring and a greater number of innovators. To her list of religious patterns, meal patterns, status (occupation) patterns, should be added economic, ecological, and "power" (drug, sexual, etc.) patterns.
>
> Habit-- It is important to note any market habits which have developed. For example, it would be foolish to sell a fresh product to a market that shops once a week. Or, to sell family-size portions or high-unit-cost items to one which uses individual servings or is concerned with poverty.
>
> Tastes-- The desire for a higher quality food, more convenience, a better grade of food, or similar indicators which show that consumers are ready to take on new sensations and experiences must be checked. For example, a change in income level might prohibit or promote acceptance of a new product.

A second approach to market research for new products is to establish a product to meet the market needs. Bauermann, et. al., (1968) suggested that the following items be considered under this approach:

Product setting-- The product should be classified as to when it is used: breakfast, dinner, snack, etc. Further classifications can also be carried out as to whether it is a meal, a component of a meal, a party item, etc.

Identifying characteristics-- Physical factors (color, shape, etc.) distinguishing this product from others must be identified. A rating in terms of taste, convenience, nourishment, and other sensory benefits should be established.

Barriers to purchase-- Areas to be investigated would include reasons why people have not bought products in this category, why alternative methods of distribution are not used, and how the predicted barriers can be overcome.

Characteristics of market segments-- Consideration should be given to socio-economic (geographic location, race, religion, or other segmentation), psychological (emotional appeals such as grading, inspection, dietetic, and health concerns), and physiological (segmentation achieved by unusual texture or spiciness for example) factors.

Influence of marketers-- The influence of a broker on a retailer, and the consumer ultimately, needs to be verified for the product area. If not broker handled, then introduction of the products to the trade and consumers must be set up.

Diehl (1970) presented a possible third approach which combines the essentials of the two approaches cited above and sets up a series of matrices which tend to highlight and single out areas of possible product development. He used a market framework (the way the market looks to consumers) based on meals and then explored "product dynamics" (what products mean in consumer terms) before setting up the matrices. This "method" approach, however, is too complicated for small firms.

Thorough market research does not guarantee success of a product, but rather it should be looked upon as a means of reducing the risk of failure of a product. Such research can provide information about the size and nature of the potential market and provide guidance for development, marketing, advertising, and promotion.

Advertising and Promotion Considerations

Advertising and promotion must be intimately involved with product development so that the whole of the firm meshes smoothly and completely in the introduction and sale of the new product. One cannot just say, "Here is the product; sell it!", to the marketing team in the firm. The same care and planning that goes into other aspects of product development must go into advertising and promotion campaigns. Dailey (1964) suggested that a good promotion plan should include the following:

1. Background information
2. Market targets
3. Promotion objectives
4. Methods of promotion
5. Budget

Strategy involved in promotion and advertising must take into account whether the new product will be primarily directed towards consumers, the trade, or a combination of both. Consumer promotion and advertising is particularly dependent upon the type of media available in the market, and also on how well these media serve the particular market. Costs, companion products of the same firm, the firm's recognition by consumers, and similar factors play a big part in decision making. Among the media available in the consumer area are newspapers, television, radio, consumer magazines, outdoor advertising, car and bus cards, promotional literature, contests, coupons and premiums, and just plain publicity (Bauermann, et. al., 1968).

Trade advertising and promotion tends to have to be a little more sophisticated than retail advertising, but there are several methods of dissemination available. Among them are a promotional

field force, trade magazines and newspapers, direct mail, in-store display material and trade conventions, fairs, or shows (Bauermann, et. al., 1968).

DeNisco (1970) revealed what the science department of one advertising agency can do in new product development. The services consist of liaison work between manufacturer and advertising agency representatives, writing up of data and technical fact sheets on the product, and technical advice during filming commercials. Lawless and Katzenstein (1969) claimed that successes outnumbered failures 10:1 when prior market research was carried out and dropped to 2:1 without prior research. They pointed out that by doing this research in the advertising agency, they are better able to "sell" the product with media, art and copy.

Alternative Outlet Considerations

Bauermann, et. al., (1968) pointed out that there are two broad outlets available to the food manufacturer to market a new product. The first is to market through the retail trade to the consumer. This involves selling through retail chain food stores and independents, particularly the affiliated ones. The second outlet is the institutional market. Institutional outlets include restaurants, hospitals, county homes, rest and nursing homes, industrial feeding establishments, penal institutions, hotels, motels, resorts, and similar dining operations. Two distinct approaches are needed for each of these markets. In the case of retail sales, packaging must be designed to stimulate sales, a brand name of some type must be promoted, a careful advertising and promotion campaign laid out,

profitability of the item must be pushed (particularly in relation to other products), unique characteristics spelled out, and a completeness of the overall line of a firm's products must be evaluated. Brokers will almost certainly need to be used by a small firm in order to sell the product.

Institutional sales must be emphasized primarily on a cost-per-serving basis with particular emphasis on preparation costs. Strong advertising campaigns are generally not needed since much of this type of outlet is serviced by wholesalers and purveyors. Branding is not a strong point, nor is package design in selling to this type of outlet.

Some people feel that a third market-entry alternative is available to processors and developers of a new food product, and that is contract production. Under this system the processor permits an established food packer or distributor to market his product for him and he would produce it under a contractual arrangement. The contract specifies in advance the volume to be produced, quality standards, and pricing or cost arrangements, along with other legal concerns such as product liability, manufacture of competitive products, and terms of remorse. In this manner the processor is relieved of marketing responsibility, but has to settle for potentially less profits.

CHAPTER III

CASE STUDIES OF TWO POULTRY PRODUCT MANUFACTURERS AND COST ANALYSIS OF THEIR SELECTED PRODUCTS

Information obtained for the two case studies was through the use of taped interviews with the management person responsible for the further processed products and his immediate superior. Answers to all questions and areas discussed were oral, except for product costs and pricing, in which instance actual cost sheets for the product selected were provided by the respective managements. Identical questions were asked of each firm, although not necessarily in the same order or at the same management level. The latter was impossible because of availability of interviewees and their access to certain types of information.

The two firms (hereafter referred to as Plants A or B) selected were deliberately chosen because they were typical of small USDA inspected firms in the further-processed poultry product industry. The U. S. Small Business Administration standard for "small" food processors of a firm with less than 250 employees was the major sizing criterion used. One firm represented a former slaughtering operation which converted completely over to further processing, and the second was one in which further processing was a small part of its slaughtering business. Questions were collated and the answers analyzed, condensed, and edited for presentation in this thesis. Each

sub-section which follows includes the replies to questions in that broad area. Names and location of the firms are left out to protect their identity; otherwise all other information is believed true and accurate.

Size and Description

Plant A:

This firm is an incorporated subsidiary of a vertically integrated corporation which consisted of two feed mills, an egg-processing-and-marketing firm, a 1,000,000+ laying-bird operation, a started-pullet supply operation, a few small broiler grow-out facilities and the chicken slaughtering plant. The slaughtering plant processed 700,000 lbs. of broilers per week on-the-average, and further processing accounted for about one percent or 7000 lbs. of that figure. Total sales volume for the latest complete fiscal year (1968) was $9 million. Only nine of the 160 total employees were employed in the further processing operation. Further processing has been carried on for two years of the more than twenty the firm has been in existence.

Plant B:

This firm is an independently and privately-owned corporation that slaughtered poultry from the mid 40's until 1967. Since 1963 they have been further processing both turkeys and chicken. Average production of further-processed products was 120,000 to 160,000 lbs. per week depending upon time of the year. Summer was the period of greatest volume. Sales volume for the latest complete fiscal year (1968) was $11 million of which about 55 percent was for further processed items. The remainder was accounted for by fresh poultry

sales and specialty cuts of raw poultry. Some 170 people were employed in the operation.

Products

Plant A:

At the time of the interview, the firm was producing three items. The first was "inherited" when the plant was purchased from its original owners; the other two were newly developed. These products were:

1. Frozen all white meat cooked, deboned chicken and gravy for both retail (1 lb. 4 oz.) and institutional sale.
2. Pieces of cooked chicken in a barbecue sauce packed frozen for both retail (2-lbs.) and institutional sale.
3. Cooked chicken parts and gravy frozen for both retail (2-lbs.) and institutional sale.

Plant B:

At the time of the interview, the firm was manufacturing twenty-four items. These products were:

1. Sliced thermoplastic chicken roll in 3-oz. retail vacuum pouch.
2. Thermoplastic chicken roll in 5-lb., 6 lb. 12 oz., and 15-lb. institutional sizes.
3. Thermoset chicken roll in 5-lb. institutional size.
4. Thermoset chicken with turkey roll in 5-lb. institutional size.
5. Chicken salad in 8-oz. retail and 5-lb. institutional size.
6. Chicken scrapple in 1-lb. retail size to a limited market.
7. Rendered chicken fat in 8-oz., 13-oz., and 4-lb. retail and 25-lb. institutional sizes.
8. Barbecued chicken in a bag of random weight and for retail sale.
9. Thermoset water cooked white, combination, and dark turkey rolls in a 7- to 9-lb. institutional size.

10. Thermoset water-cooked sliced white turkey roll in 3-oz. retail vacuum pouch.

11. Philadelphia-style oven-roasted white, combination, and dark turkey rolls in 6- to 7-lb. institutional size

12. Thermoset oven-roasted white turkey rolls in 7-lb. institutional size.

13. Whole smoked turkeys for both retail and institutional sale.

14. Sliced smoked pressed breast of turkey in 3-oz. retail vacuum pouch.

15. Turkey salami in 5-lb. institutional size.

16. Chopped chicken livers in 3-lb. casing for institutional sale.

17. Chicken-a-la-king in 3-lb. casing for institutional sale.

18. Two retail packs of pre-cooked breaded fried chicken just about to go into market. Items were packed in 1 lb. 12 oz. aluminum tray.

19. A chicken pattie made by another firm to Plant B's specifications and from materials supplied by Plant B. Institutionally sold in bulk 10-lb. box.

Distribution

Plant A:

Distribution was through brokers in Washington, Baltimore, Boston, and Philadelphia.

Plant B:

Broker distribution was primarily used in California, Arizona, Maine to Florida on the eastern seaboard, west to Wisconsin, Michigan, and Chicago. Major strength was reported to be in Philadelphia, Baltimore, Washington, Boston, New York, Buffalo, Pittsburgh, Albany and Syracuse. The firm now plans to concentrate east of Green Bay, Wisconsin. Los Angeles was proven to be a costly market because one week of the

minimum 5-week shelf life is taken up by shipping. All items shipped to Los Angeles were fresh and not capable of being frozen.

Method of Product Development

Plant A:

New product ideas come from a former broker who was the firm's sales manager. He apparently self-generates non-competitive products which he and his wife partially develop and then turn over to a research and development man and kitchen foreman to perfect. New products must be limited at present to existing facilities and equipment. A time period of seven to eight months elapsed for the chicken and gravy concept to be perfected. This time was longer than anticipated because several bad leads were followed on solving a rancidity problem which developed after 90 days' storage. They realized professional technological aid might have helped, but it was not solicited.

Plant B:

New product ideas come from the sales department, with possibly fifty percent of those originating with brokers and buyers via the sales force. Management indicated preference for this source because it felt brokers and buyers have the pulse of the public and food chains. Duplication of competing products was done and also used for leads to other related products. No new product ideas were solicited from consumers because the firm already had received too many ideas from other sources. The procedure usually followed was for the sales department to provide a description of a new product and then for the product development people to set up different flavor or other variations for management to test.

Raw Ingredient Sources

Plant A:

No raw ingredient standards were set up either for outside or in-house sources. The one exception was the size of shell (ready-to-cook chicken without giblets or neck) used in the products containing pieces of chicken, in which a weight size was specified. Sauces, gravies, and the like were purchased on the outside already prepared.

Plant B:

All chickens and turkeys were purchased from USDA-inspected plants. Samples had to be submitted by prospective suppliers for visual check of defects, olfactory examination, and if necessary, a microbiological check. Over a period of years and from previous experience in slaughter operations, the firm had a general knowledge of the quality of supplies from most prospective suppliers. Shipments were rejected on occasion, based almost exclusively on visual and olfactory determination. Since most supplies were brought in fresh, loads had to be rejected on the spot or else be accepted; a holdup pending microbiological test results could cause spoilage. Other ingredients were subjected to the same visual and olfactory tests, plus microbiological tests whenever warranted. Lots with off-flavors, off-odors, off-color, abnormally high microbiological counts, or other defects were rejected and shipped back to the supplier.

Quality Control

Plant A:

No formal or regular testing regime was followed with the exception of routine flavor-shelf-life tests on products by production and management personnel. When queried on microbiological testing, the firm admitted "they have sent some out to be checked." This "checking" appeared to consist of one or two total plate counts early in the development of the products. Since "they came back okay", the firm did nothing more. The reason given for this lack of action was "beacuse the firm was too small."

Plant B:

The quality-control staff at the firm consisted of a consulting food technologist who spent two days a week in the plant, a foreman who also spent part of his time in product development, and three women whose responsibilities were as follows: (1) 1/2-time quality control, 1/2-time product development, (2) full-time quality control, and (3) 1/4-time spice mixing, 1/4-time clean up. The quality-control staff took samples of product throughout the day and performed checks for consistency and "normal" characteristics of flavor, uniformity, and texture. Samples of products were taken periodically throughout the week and sent to an outside commercial laboratory for microbiological examination. Tests for total plate count, coagulase positive staphylococcus, Coliforms and salmonella were run continuously. Streptococcus tests were run occasionally.

Testing procedures concentrated most heavily on the biggest

production item, but other items were "hit harder" if test results indicated any tendency for them to deviate from accepted standards.

Proximate analysis (protein, fat, carbohydrate, ash, and moisture content) was done by the outside commercial laboratory, but not on a routine basis.

Package Design

Plant A:

Package design was done completely by the firm that printed the cartons. The processing firm had a hand in technical advice only during the filming of the vignette used on the package.

Plant B:

Package design was determined partly by the product-development personnel on the basis of function and partly by the sales group on the basis of appeal and design. All products bore the distinctive firm logo and featured the firm name. Since most of the firm's products were sold on an institutional basis and primarily in one form of packaging, the art department of the packaging supplier provided design and color suggestions. The firm had shown little interest in retail items because it felt it did not have finances and distribution to sell a retail market.

Market Testing

Plant A:

No formal consumer-testing program was carried out. When it was felt that a new product was sufficiently developed, a few of the plant

employees and the plant management hierarchy tried it. When they approved of it, the product was then taken out by the sales force for comments from brokers and buyers. If that reaction was favorable, they then got the product in a couple of stores and used that success to persuade others to stock the item.

Portion and package size were determined by going out in the marketplace to see what and how similar products were packed, and then they packed accordingly. No innovations or tie-ins with other products were attempted.

Plant B:

Much the same testing program was followed by Plant B as was outlined above for Plant A. No formal program was followed and when the management group approved, the product was sent to a broker who submitted it to several of his accounts. The firm indicated that experience had shown when the product was accepted by those accounts, the other brokers and their accounts would find it acceptable. The firm had experimented with using commercially-run consumer test panels, but had not found them very reliable. They also had tried using test stores for limited sales of products just being developed, but because most of their products had been institutional, they did not use them routinely.

Portion and package size were determined by the sales group analyzing what they thought the market for the product would be. Generally speaking, price was a big determining factor in regard to their decision. When they thought that costs had soared beyond the normal price range, they picked a smaller portion to decrease selling

prices, or packaged more of the product per unit to increase selling prices.

Advertising

Plant A:

Advertising of the firm's further processed poultry products was somewhat hindered in that they appeared as only part of a house advertisement for the firm's major product, ready-to-cook poultry. This type of advertising appeared in one trade magazine (Broiler Industry) and in the Sunday supplement of a local major city newspaper.

The firm was quite excited about its latest advertising, which consisted of 11 "spots" per week over a 4-week period on an independent television station in the major marketing area for a retail product they had introduced a few months before and whose sales had now plateaued. The television advertising was to serve three purposes. First, it was to be a test to see if TV advertising would increase sales of the product. Success or failure was to be measured by before and after sales volumes. Second, it was hoped that the TV effort would influence other retail outlets in the marketing area to handle the product and thereby increase market penetration. Third, the firm did not use an advertising agency and wanted to see if they could "do-it-themselves", and what the cost would be.

The independent station was chosen because it covered only the marketing area, whereas the three network stations spilled over into adjoining marketing areas. The cost of the project was $2200 for the taping of the commercial, the talent used in the spot, and the running

of the 11 spots over the 4-week period. Costs were virtually identical for all four stations. The firm decided on time slots scattered over the day and evening, but directed towards programs with a high woman-viewer rating and the age bracket of 18 to 49 years. The decisions by the firm as to viewing audience were not based on market research, but simply on the personal intuition and expectations of management.

Plant B:

The firm employed an advertising agency, but management determined where the advertising dollar went. They told the agency what was wanted in the way of an advertisement and then the agency laid it out for management's approval. Advertising follows a set pattern only in the trade papers (Producers' Price Current, Supermarket News, and six food terminal papers such as Food Trade News, Griffin Report, Food Distribution News, etc.) where the advertisement may introduce a new product or simply keep the firm name before the public (wholesale buyers). Some advertising was done in daily newspapers, but this was generally a cooperative deal with a supermarket chain's weekly food advertisement.

Other media used in the past and expected to be utilized again include billboards and radio. Television had been used in the past; however, the firm has not been satisfied with the results. They admit television gives the most exposure, but claim that one cannot measure its sales value.

Pricing Policy

Plant A:

The cost of manufacture was estimated, a survey was made to see

what like products were selling for, brokers' advice was solicited (and followed very closely), and then they tried to set the highest price they could get for the product. There was some evidence that an established retail price on the market for like items was used as a base, and then the "standard" thirty percent markup was taken off, (which the retailer has put on) along with five percent for the broker. This resulting figure was the "plant selling price".

A break-even price was not determined. It was pointed out that the retail products were not making money because of the high cost of getting the products into the stores. The management noted that a lot of product would be given away before it got into the stores. A volume estimate of sales of the products was not available; they simply hoped to tax the present facilities and then grow accordingly.

Plant B:

The cost of manufacture of the product as developed was established. To this was added a "normal" manufacturing and distribution margin to determine the plant selling price. A retail selling price was worked out from the plant selling price. As an example, a chicken spread in an eight-ounce container cost forty cents to manufacture. A margin of thirteen cents was added to this price to obtain the plant selling price of fifty-three cents. A distributor would then mark up the spread to sell at sixty-one cents, and the retailer would add his markup to sell at retail for eighty-nine cents.

Promotions for the chicken spread were handled by using promotion and advertising allocations in the thirteen cents differential between the manufacturing cost and plant selling price. A typical example

found the distributor selling at forty-five cents (based on a fifteen percent reduction in plant selling price) and the retailer selling at sixty-nine cents or seventy-nine cents per unit depending upon whether he wanted a high or low promotion feature.

The firm determined the break-even point on the product immediately since the manufacturing cost was estimated as if in full production. The firm then sold on that basis. If the volume was not generated as predicted in the manufacturing cost, the product was dropped. No fixed time for the drop-no drop decision was made. Whether or not to drop the product was based on many considerations, although the buyers' attitudes were a prime factor, since, if they did not like the product themselves, they would quit buying it. On the other hand, even if buyers liked it and it still did not meet volume predictions, management would decide to drop the product.

Costs

Plant A:

This firm provided the cost breakdowns for two of its products. Several of the cost factors were really unknown, but management used figures that they felt were generally correct based on experience from other operations. Among these cost factors were freezing, which was fixed at 1/2¢/lb., trucking (including billing tallying, labor, etc.) at 2¢/lb., and an overhead cost on the finished product of 2¢/lb. Labor costs included all labor, both direct and indirect.

No development costs as such were figured into the product cost since the firm expected these to be covered as part of labor and over-

head expenses on existing products, both raw ready-to-cook and further-processed.

Product: 11-oz. chicken w/gravy in retail aluminum foil pan with cover and carton, packed 12 per master case

Ingredient cost:		
Gravy	.0138	
Chicken white meat, cooked	.3322	
Packaging costs:	.1165	
Labor (adj. @ $2.00/hr.)	.1891	
Freezing (@ 1/2¢/lb.)	.0050	
Trucking (@ 2¢/lb.)	.0200	
Overhead expense (@ 2¢/lb.)	.0200	
Total plant cost (per lb.)	.6966	
Discount (2%, 10 days)	.0155	
Promotion (3% of selling price)	.0233	
Brokerage (5% of selling price)	.0387	
Plant selling price (per lb.)	.7741	
11-oz. unit or tray selling price		.5322
Master-case price as estimated above		$6.39
Actual selling price per case		$6.25

Product: 2-lb. cut chicken w/barbecue sauce in retail aluminum foil pan with cover and carton, packed 6 per master case

Ingredient cost:		
Barbecue sauce	.0468	
Seasoning	.0035	
Chicken (1-3/4 lb. shell @ 33¢/lb.)	.2888	
Packaging costs:	.0695	
Labor (adj. @ $2.00/hr.)	.0500	
Freezing (@ 1/2¢/lb.)	.0050	
Trucking (@ 2¢/lb.)	.0200	
Overhead expense (@ 2¢/lb.)	.0200	
Total plant cost (per lb.)	.5036	
Discount (2%, 10 days)	.0113	
Promotion allowance (3% of selling price)	.0170	
Brokerage (6% of selling price)	.0340	
Plant selling price (per lb.)	.5659	
2-lb. unit or tray price		$1.13
Master case price as estimated above		$6.78
Actual selling price per case		$6.90

Plant B:

Costs for this firm were available for several of their products, and three were selected. The first, chicken salad, was sold to brokers and distributors for retail sale and will provide an insight into costs of a product with a high packaging and marketing effort. The second was an oven-roasted turkey breast, which was sold through brokers and distributors, but only for institutional sale. It could be expected to have a low packaging cost but high manufacturing cost. The third was a turkey salami, which was sold through the brokers and distributors for sale primarily to retail outlets who had to slice it to sell it. This item had both low packaging and low manufacturing costs, but these were coupled with somewhat higher marketing costs.

The available costs were in much greater detail than those received from Plant A and were based on actual cost figures rather than on estimates for some cost factors. This could be attributed to more experience in manufacturing and marketing further-processed poultry products.

Product: 8-ounce aluminum cup of chicken salad with sleeve overwrap, packed 12 per master carton

Ingredient cost:		
Cooked diced chicken meat	.332	
Other ingredients	.095	
Packaging cost	.193	
Direct labor	.093	
Indirect labor (28% of direct labor)	.026	
Payroll taxes (5.5% of payroll)	.006	
Fringe benefits (16% of payroll)	.019	
Overhead provision	.023	
Operating expense provision	.028	
Total plant cost (per lb.)	.815	
Commission (3% of ave. selling price)	.032	
Total plant selling price (less margins)	.847	(per lb.)
Ave. selling price previous 4 weeks	$1.02	(per lb.)

Product: Random weight (approx. 7 lbs.) oven-roasted turkey breast, packed individually and 6 to master carton

Ingredient cost:			
Raw boned turkey white meat	.8191		
Other ingredients	.0038		
	.8229		
Ave. 89.5% yield		.9187	
Other ingredients added after cooking		.0096	
Packaging cost		.0407	
Direct labor		.0453	
Indirect labor (22.5% of direct labor)		.0010	
Payroll taxes (5.5% of payroll)		.0025	
Fringe benefits (16% of payroll)		.0074	
Overhead provision		.0233	
Operating expenses provision		.0280	
Total plant cost (per lb.)		$1.0765	
Commission (3% of ave. selling price)		.0351	
Total plant selling price (less margins)		$1.1116	(per lb.)
Ave. selling price previous 4 weeks		$1.17	(per lb.)

Product: Random weight (approx. 5 lbs.) turkey salami, packed 2 per carton

Ingredient cost:			
Raw boned turkey dark meat	.1206		
Other ingredients	.0214		
	.1402		
Ave. 88.5% cooked yield		.1605	
Packaging cost		.0638	
Direct labor		.0725	
Indirect labor (24.5% of direct labor)		.0178	
Payroll taxes (5.5% of payroll)		.0050	
Fringe benefits (16% of payroll)		.0144	
Overhead provision		.0233	
Operating expense provision		.0280	
Total plant cost (per lb.)		.3853	
Commission (3% of ave. selling price)		.0165	
Total plant selling price (less margins)		.4018	(per lb.)
Ave. selling price previous 4 weeks		.55	(per lb.)

Management of the firm gave the following breakdown of items included under the costs listed on the previous pages:

Packaging cost-- All material and supplies, packaging labor included in direct labor.

Direct labor-- All labor directly associated with the product.

Indirect labor-- Selling salaries, supervision, product development, officers' salaries, janitorial, office salaries, warehouse, and maintenance.

Overhead provision-- Plant rental, equipment rental, depreciation, repairs and maintenance, interest, refrigeration, storage, taxes, personnel expenses, USDA inspection, insurances, heat, light, and power.

Operating expense-- Office expense, trucking and delivery expenses.

CHAPTER IV

CONSUMER PREFERENCE STUDIES OF SELECTED POULTRY PRODUCTS AND CHARACTERISTICS

The Michigan State University-Wayne State University Detroit Consumer Preference Panel (hereafter called MSU-WSU Consumer Panel) as described by Marquardt (1964) was available for preference testing a limited number of poultry products. The panel originally met four times a year, but in the last two years had met less often due to several external conditions. Nearly a year had elapsed since the previous meeting of the panel. Both processing firms in this study were contacted and asked to submit two or three suggestions of products and consumer-oriented questions they would like to have answered about these products. From these suggestions three products and characteristics about each were selected for presentation to the panel. The product, questionnaire, and panel results are hereinafter described.

Relative Utility of Frozen Chicken and Gravy

Plant A:

The firm was just introducing a 2-lb. frozen cooked chicken-parts-in-gravy product in an aluminum pan with a chipboard carton overwrap for retail sale. The prepared products manager indicated he did not know if their suggested retail price of $1.59 per carton was competitive

or a "value" in the consumer's mind. Since no directly comparable product was on the market, they were being guided in their pricing by existing products that were indirectly related via competition.

One means of measuring the relative utility of this product against that considered competitive is the Von Neumann-Morganstern method described and used by Marquardt (1964). Their model suggested that the utility or subjective value of a sample may be substituted for its objective value in the calculation of an expected value.

For the purposes of this study, a well-known 2-lb. frozen cream-style gravy with sliced chicken (sliced from a chicken roll rather than from pieces of deboned chicken) product, which had been on the Detroit market for some time, was compared to the cooked chicken parts in gravy of Plant A. This latter product had never been offered for sale on the Detroit market. Because of the difficulty in heating the products and maintaining an attractive and uniform appearance over an eight-hour time period of the panel, the products were left frozen and the vignettes of the product on the carton were used by the panelists for comparison purposes. In each case, the photograph-vignettes were accurate in depicting the contents of the package, and the consumers were so informed. Seventy-five cents was placed next to the cream-style gravy and sliced chicken and this combination was labeled "Display One". The other carton with cooked chicken parts and gravy was labeled "Display Two". The seventy-five cents was identified with typewriter symbol #, the cream-style gravy with sliced chicken was symbol *, and the chicken parts with gravy was identified by symbol %.

FROZEN CHICKEN PRODUCT

Michigan State University - Card 1 -

1. Rank the samples according to your first, second, and third choices:

#_____ *_____ %_____

2. Check either Display One or Display Two in each of the 11 stores.

DISPLAY ONE	DISPLAY TWO
Store One	
All chances are Sample * a frozen chicken product, No chances of Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Two	
9 chances are Sample * a frozen chicken product, 1 chance is Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Three	
8 chances are Sample * a frozen chicken product, 2 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Four	
7 chances are Sample * a frozen chicken product, 3 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Five	
6 chances are Sample * a frozen chicken product, 4 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )

Name:_____

FIGURE 1. Questionnaire Card 1 Used in Measuring Relative Utilities of Two Concepts of Chicken and Gravy.

FROZEN CHICKEN PRODUCT - Card 2

Store Six 5 chances are Sample * a frozen chicken product, 5 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Seven 4 chances are Sample * a frozen chicken product, 6 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Eight 3 chances are Sample * a frozen chicken product, 7 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Nine 2 chances are Sample * a frozen chicken product, 8 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Ten 1 chance is Sample * a frozen chicken product, 9 chances are Sample # money ( )	All chances are Sample % frozen chicken product, a sure choice ( )
Store Eleven All 10 chances are Sample # money. No chance of Sample * frozen chicken product ( )	All chances are Sample % frozen chicken product, a sure choice ( )

Name: _____ Comments: _____

FIGURE 2. Questionnaire Card 2 Used in Measuring Relative Utilities of Two Concepts of Chicken and Gravy.

Each panel member was given two cards as shown in Figure 1 and 2. They were then asked to indicate which of the three items in the displays would be their first, second, and third choice, assuming they had been awarded a prize. The purpose of the first question was to establish rationality in the consumer and to obtain an ordinal measurement. This first part of the questionnaire was designed to eliminate those consumers who would take money under any circumstances because "I hate chicken!", or similar reactions. Of 109 respondents, twenty-three indicated a clear preference for the money and thus were eliminated from any further consideration, and ten more quite obviously did not understand the procedure and had to be eliminated.

Overall results of this phase of the study were very disappointing from several aspects. First of all, the panelists were for the most part experienced in that they had participated before in the M.S.U.-W.S.U. Consumer Panel on a number of occasions. In addition many of them had likewise participated in the Von Neumann-Morgenstern model. They were also briefed by the panel director on the proper procedure for this method before they participated in it. In spite of this experience, it was obvious that most of the panel did not comprehend how to do the test, and the attendant at the display had to re-explain constantly how to undertake the test correctly. All of this provides a certain lack of confidence in the validity of the panel results.

Unexpected but very strong apparent prejudices came to light as the panelists paused at and discussed the display. For example,

many of them recognized the cream-style gravy and chicken as a brand they had tried before and did not like, because of, in their opinion, the excessive amount of gravy present in relation to the chicken. They therefore chose Display Two every time in order to avoid getting any of the undesirable product. In effect this placed a rating of "no value" on the cream-style gravy with chicken, but did not really establish a value on the chicken parts and gravy, except, since the respondents did not switch over at Store Eleven when they had a chance at 75¢ only, they presumably valued the chicken parts and gravy at more than 75¢. The strength of this prejudice was tested and confirmed when the cream-style gravy and sliced chicken was put in Display Two and the chicken parts and gravy was put in Display One with the money. The panelists promptly switched over to checking Display One in every store to avoid getting the product in Display Two. In effect then, since they did not switch displays at Store Eleven, they rated the "value" of the cream-style gravy and sliced chicken at least less than 75¢. It was noted that, although some panelists did not exhibit the prejudice cited above, they had one equally strong for chicken in any form. They were observed checking that column which would give them chicken every time, which of course was Display Two. It did not seem to matter to them which chicken was there, just so long as they got chicken. They seemed unable to or unwilling to go to Display One in any store. Presumably they had not previously tried the cream-style gravy and sliced chicken.

Unfortunately, of the seventy-six panelists remaining, forty-six exhibited the prejudices cited above. Thus, only thirty of the

panelists could be classified as having correctly completed the questionnaires. The results for both the afternoon and evening sessions of the panel did not present a sufficient number of panelists at any crossover to reach a valid conclusion as to the value consumers would place on the product.

Consumer Preference for Chicken-Salad Packaging and Taste

Plant B:

This firm packaged its chicken salad in an 8-ounce container to be sold under refrigeration at retail sale. The salad was made from fresh ingredients and in order to provide the minimum four-week shelf life necessary, the firm had developed a means of pasteurizing the product after it had been packaged. The package was a 400x201 aluminum cup to which was double-seamed an aluminum 401 lid with a full-panel pull-out. The cup was not attractive by itself, nor could mandatory information be printed on it because of the large quantity of cups required to be ordered to do so. As an alternative, the cup was placed in a chipboard sleeve, which provided printing area and a more attractive package. Management of the firm was not satisfied that this package conveyed a "salad image" and also wondered if the full-panel pull-out was judged convenient by consumers as was supposed.

In order to answer these questions, a display was set up consisting of three containers. Symbol # was the previously described Plant B package. Symbol % was a yellow plastic cup with a clear plastic set-in type cover and which contained 8 ounces of salad and

was of approximately the same configuration as the aluminum cup. Symbol @ was also a yellow plastic tub but had an opaque lid and held one pound or 16 ounces of salad. It was typical of that used for selling cottage cheese and undoubtedly had a "dairy-delicatessen image". The consumers were asked the following question: "Of the three packages displayed, which would you expect to see fresh chicken salad packed in? (Please check one)." Their answers are shown in Table 1. By simple inspection it can be seen that 86.4 percent of the consumer-panelists preferred symbol %, which was the yellow plastic cup with clear plastic lid that held 8 ounces of product and had a configuration similar to the Plant B package. Unfortunately, this container cannot withstand the rigors of Plant B's pasteurization treatment, but the results did confirm management's suspicions that their current package did not convey a strong "salad image" to the consumer.

Table 1. Preferences of Consumers for Selected Salad Packages

Plant B Package	8-ounce Plastic Cup	16 ounce Plastic Cup	Total
2	95	13	110

The consumers were also asked to rank the packages in the order which they felt would be most convenient to use. The results are shown in Table 2. To determine if the differences obtained were

significant and to determine the overall ranking of the containers as

Table 2. Consumers' Ranking of Selected Salad Packages as to Convenience

Rank	Plant B Package	8 ounce Plastic Cup	16-ounce Plastic Cup
1	3	57	34
2	26	19	50
3	66	18	11

to convenience of use, a Coefficient of Concordance, as described by Moroney (1967), was determined. This ratio is set up on the basis of the Null Hypothesis of no agreement amongst the judges. It is designed so that it can vary from 0, signifying complete randomness in allocation of rankings, to 1, signifying complete agreement among the judges.

The Coefficient of Concordance (W) calculated for the ranking by convenience of the packages was 0.316, which indicated a high amount of disagreement amongst the judges. Snedecor's (1956) distribution for F was used to test for significance and W was found to be significant at greater than the 1% level. Therefore, ranking the containers by convenience of use resulted in the 8-ounce yellow plastic cup with a clear plastic set-in lid being judged most convenient to use followed by the yellow plastic tub of 16-ounce capacity and opaque snap-on lid and, finally, Plant B's 8-ounce aluminum cup and lid.

Industry vs. University

A unique opportunity was available to test a commercially made and sold poultry product against a university-developed poultry product. The chicken salad manufactured by Plant B requires a pasteurization treatment after packaging. This treatment was limited and could not be done prior to packaging due to the instability of the salad dressing at 180°F or higher temperatures. The difficulties in packaging and marketing this product because of the pasteurization requirement have been alluded to before. The chicken salad recipe developed at Pennsylvania State University utilized dry ingredients to provide uniformity in manufacture and easy inventory, but most importantly, used a cooked salad dressing which permitted packaging without pasteurization along with extended shelf-life.

The M.S.U.-W.S.U. Consumer Panel was asked to rate the salads as to flavor on the 5-point Hedonic scale. Two concepts of the Pennsylvania State University salad were tested separately against Plant B's salad. The first P.S.U. salad concept contained dehydrated celery made primarily from leaves, and the second concept had celery composed mostly of diced stalks. Flavor levels of celery in each concept were identical, but the leaf celery gave a dark green cast to the overall salad color. The stalk celery by contrast was lighter and more yellow in color. In neither case were the P.S.U. salads as light or yellow-white in overall color as Plant B's. The results of the Hedonic taste test are presented in Table 3 where a score of "5" was equivalent to "Like very much" and a score of "1" was equivalent

to "Dislike very much". As can be seen in the table,

Table 3. Consumer Preference for Taste of Chicken Salads

	Plant B Salad	P.S.U. Salad Leaf Celery	P.S.U. Salad Stalk Celery
Ave. Score	4.02	2.10	2.68
Total consumers tasting	106	56	50

a marked liking was shown for the taste of Plant B's salad and a marked dislike of the P.S.U. salads. There is some evidence that color may have influenced taste since the consumers ranked the stalk celery salad slightly higher in taste score than the leaf celery salad.

In each of the two sessions involving tasting, the consumers were asked to rank the Plant B salad vs. the particular P.S.U. concept after they had separately ranked them as to taste score. Ninety-four percent of the consumers preferred the Plant B salad to the P.S.U. leaf celery salad and eighty-six percent of them preferred the Plant B salad as compared to the P.S.U. stalk celery salad. In the face of these overwhelming preferences, it appeared that with respect to taste, the university salad needs further development.

CHAPTER V

FURTHER ANALYSIS AND DISCUSSION OF DATA

Marketing

Small firms in further processing of poultry conducted no formal market testing or consumer studies. Marketing *per se* received little attention. This could be seen from attitudes displayed by the company managements interviewed. One reason for this may be the inability of the managements to analyze and comprehend results, or to make use of the data in making marketing decisions, programs, and projections. This was often attributed to pressure of other business activities on small executive staffs, which frequently consisted of only one or two persons, or staffs with no training in marketing *per se*. A second reason brought out was the high cost relative to other expenses the firms encountered.

The consumer studies on poultry products with the M.S.U.-W.S.U. Consumer Panel were designed to show these firms how consumer panels could help them. The results tended to substantiate the beliefs of the firms with regard to the value of consumer tests on the one hand, but did demonstrate the tests' validity on the other. The Von Neumann-Morgenstern method of measuring relative utility of a product proved to be difficult for the experienced panel to do, was accepted reluctantly by Plant A as being credible and capable of giving the

results intended, and utlimately generated meager results of bare credibility.

The salad-packaging and taste-panel results were clear cut, simple to understand, and quickly accepted as genuine by Plant B's management. Perhaps this ready acceptance was due to the fact that the results tended to substantiate beliefs already held by the firm's management.

In actuality, both firms relied heavily on brokers and the retail food store buyers' reactions, as expressed by the brokers, for consumer reaction. Both managements expressed the thought that "if the brokers and buyers don't accept it, neither will consumers". On the one hand, this could be considered a tribute to the brokers' and buyers' knowledge of the market, but it also showed an almost child-like faith in the omnipotent marketing power of brokers.

One may successfully argue that the reason for the "expertise" of the brokers and buyers was that most of the further processed poultry items shown to them are "me-too" types of existing red meat products. They can often give "expert guidance" to a firm based on their previous experiences with a similar red meat item offered to consumers.

Costs

Initially, as a firm went into further processing, true costs were seldom known. As the commitment to further processing became larger, the sophistication of costs, equipment, and the like became greater. Calculation of the percentages that fixed, semi-fixed, and

variable costs made of the total, by products, indicated that some products carried a disproportionate share of these costs. The data in Table 4 illustrates this point.

No discernible pattern was evident to account for the disproportionate allocations. Neither high margin nor high volume had any effect on allocation. Each firm assigned an identical established amount for fixed costs to each product. This caused fixed cost allocation as a function of total costs to vary with the amount of the manufactured cost. High manufacturing costs resulted in low fixed cost on the product. Low manufacturing costs produced high fixed cost allocations. Such a policy could be detrimental to new products with low production costs, if they are required to share "full costs" during initial stages of marketing. Overpricing may hurt its chances of success. On the other hand, a high cost item may actually be underpriced and in the long run could financially hurt the company involved.

Plant A's estimated costs of two cents a pound for trucking and two cents a pound for overhead were not far off from the actual costs of 2.8 and 2.3 cents a pound, respectively, as reported by Plant B.

Each firm reported brokerage commissions to be increasing. This was accepted because both firms felt the services provided by brokers were increasing. It is interesting to note the magnitude of the difference between commission rates paid by the two firms. The three-percent rate paid by Plant B was considered a more "usual" rate. Plant A indicated they were forced to pay the higher six-percent rate to get a good broker to handle the product. Reasons to justify the higher rate were the limited product line, higher introductory efforts

Table 4. Percentage Allocation of Total Manufactured Cost by Plant and Product

Product	Fixed	Semi-fixed	Variable	Total
Plant A				
Boned chicken and gravy	3.6	30.0	66.4	100.0
Chicken and barbecue sauce	5.0	13.9	81.1	100.0
Plant B				
Chicken salad	6.3	6.2	87.5	100.0
Oven roasted turkey breast	4.8	1.0	94.2	100.0
Turkey salami	13.3	9.7	77.0	100.0

and costs by the broker, and the fact that the product was frozen, which traditionally called for a higher commission rate. A difference such as that cited would certainly work against a small firm, a firm with a limited production line, or against new product development *per se*.

New Products

In this study brokers were the most important, if not complete, influence on new product development. Plant B management cautioned, however, that brokers must be selected with care. For example, brokers who handle ice-packed poultry may not be geared to sale of further-processed poultry products, or they may give little attention to a one-line company.

Further-processed poultry products on the market appear to be innovations to many in the poultry industry. Yet, examination of the firms' product lines indicated few, if any, true innovations. Most of them should be classified as imitations or substitutes. Plant A's chicken and gravy products were clearly imitations of existing products on the market.

Plant B innovated with some poultry products such as a fully-cooked barbecued chicken in a bag, pre-cooked breaded fried chicken parts, and a refrigerated canned chicken salad with several weeks' shelf-life. Their biggest volume items, however, were chicken and turkey luncheon rolls and the first item the plant made, which was a chicken scrapple. All of these items were substitutes for red meat products.

Grieg (1964) pointed out that a firm produces on the basis of expected consumer wants and that they must know consumers' activities, habits, tastes, wants, and customs. As a result there can be quality competition in vertical, horizontal, or innovational forms. The further processing of poultry has resulted in vertical quality competition in the industry. For example, several firms produce chicken rolls of essentially the same thermoplastic type. The only difference between them is their quality. The same is true for poultry meat pies and white meat turkey luncheon rolls. Horizontal quality competition has been restrained by economic factors. The relatively high cost of poultry meats, as compared to red meats, commands that they be used in high quality and high cost products. This limits their competitive position vis-a-vis red meats.

Quality Control and Packaging

Sophistication of quality control, when it existed in small further-processing plants, was very low, and so it was with both firms interviewed. No testing program or specifications for raw materials existed in either plant. Plant A did virtually no quality control while Plant B did a limited amount on finished production. As with marketing, the reason for lack of activity in this area was due to a lack of personnel in management capable of performing the work or interpreting the results.

Packaging suffers by much the same comparison. No packaging research was carried out by Plants A or B. Size of container, performance, graphics, packaging material, etc., were dictated by

competitive products either directly or indirectly, economics, or the packaging supplier. Because packaging machinery costs were so high and minimal quantities of custom-design materials so large, many small plants were limited to semi-automatic machinery for filling and packaging and stock designs and sizes of packaging, particularly with respect to retail containers. Casing suppliers and corrugated container suppliers offered extensive graphic services to processors at minimal cost. Therefore, institutional packages frequently appeared better designed than retail containers of small processors.

Television Advertising

The results of Plant A's television campaign were rather disappointing to management. An increase in sales was only temporary and did not sustain itself beyond the first week. Market penetration was helped slightly when two more supermarket chains (one large, one small) took on the firm's product line. This left only one dominant chain in the area and two distributors who did not handle the product in the market. The firm felt that television advertising did not pay off. Much could be said as to whether the campaign was executed properly, whether or not using a network station rather than an independent station would have achieved better results, whether a more active or frequent number of television spots would have done better, etc.; but these are questions that only more testing and research can answer. This, the firm was not interested in doing.

Pricing Policy

A big difference existed between the two plants studied in determining or setting prices for products. Yet, this writer's experiences in working with other further-processing firms indicated that both pricing policies do exist with the smaller firms in the industry. A number of firms followed the same procedure as Plant A in establishing price, which is to say they estimated it one of several ways.

For example, the firm may use a competing product's price as its own and assume that if the competitor is making money, it will, too. Frequently, the competitor may be a large firm with high volume, and the smaller firm rationalizes that what savings are lost with its low volume can be made up through lower advertising, marketing and/or packaging costs to the smaller firm. A second method used was to show the product to several brokers and/or buyers, soliciting their advice on price, and then juggling ingredients, amounts, quality, and packaging to meet this price. A third method usually involved the advice of the firm's accountant. He recommended that the firm determine its ingredient cost and add a twenty-five to forty percent markup "like the rest of my clients". Still another variation was when the product cost the plant "nothing". This unique rationalization was brought on when the product was made from what was by-product of another operation and had been previously discarded. Thus, whatever was earned with this former by-product was gravy, either figuratively or literally.

Plant B had a more solid framework for establishing price. But, even so, there was dissension within management on what cost factors should be allocated to new products. For example, some felt the product should bear its full share of costs, particularly overhead, start-up expenses, and the like. Others in the firm's management felt the product should be allowed to mature to some extent before full costs were assessed. Obviously, much depends upon the financial position of the firm as to what share of the costs are assessed to a new product. In some instances the firm may want to be flexible in this regard.

CHAPTER VI

SUMMARY

Managements of small further-processing poultry firms studied were heavily dependent upon brokers for marketing advice, sales, and distribution of their new and developed products.

True costs were frequently not known by the small further processor, particularly with respect to new products, but the various methods of estimating costs appeared to be sufficiently accurate to permit a firm to go to market without fear of being too far out of line.

Quality control on finished products, when practiced, was very cursory. No raw ingredients/materials specifications were established and the firms studied relied on the integrity and reputation of their suppliers. A lack of appreciation for quality control and its importance was partially the reason, but more frequently no one in management was capable of understanding any chemical and/or microbiological tests or their results.

Outsiders were cited by small further poultry processors studied as the source of most new product ideas; those most frequently mentioned were brokers, buyers, ingredient/additive suppliers, and competitors.

Suppliers were frequent sources of services to the firms in the study. Among the service areas involved were technology in relation

to food additives, engineering, spicing and flavorings, and particularly packaging and services related to it, such as graphics and materials.

No formal market-testing program was carried out by the firms in this study. In part, this was due to managements which lacked knowledge to plan, execute, or comprehend a marketing study, and in part, due to the fact that their brokers often provided well-thought-of aid in this area. The use of consultants and consumer testing had been made by the firms, but the results were considered of little value and certainly not worth the money spent to obtain them.

Advertising was used sparingly, and certain forms of it were considered to have little merit. Among those most prominently cited were television and most other forms of retail advertising. The only exceptions to the latter were coupons in chain-store advertisements and similar cooperative promotion efforts.

Management of the firms was found to be inexperienced and in many respects totally lacking in knowledge in the areas of quality control, marketing, and engineering. Strengths appeared to be in the areas of general business knowledge, sales, and production. Both the firms were in sound financial condition, undoubtedly a reflection on their management.

Consumers from the Michigan State University-Wayne State University Detroit Consumer Preference Panel showed an overwhelming preference for an eight-ounce capacity plastic cup with plastic lid as projecting a "salad image" over an eight-ounce capacity aluminum cup with aluminum double-seamed lid. They also chose the same preference

with respect to convenience of use of the packages.

The panelists indicated they had a strong liking for a commercially-developed chicken salad and a dislike for a chicken salad developed by Pennsylvania State University.

Consumers from the panel who did not express a dislike for chicken demonstrated the value of a commercial frozen 2-lb. cream-style gravy and sliced chicken to be less than 75¢. They also determined a new competitive frozen chicken parts and gravy to be more than 75¢ in value.

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APPENDIX

APPENDIX

Product Development Checklist

1. New Product Sources

   A. Brokers, buyers, distributors and sales personnel
   B. Ingredient and food additive suppliers
   C. Competitors
   D. Trade fairs, associations, and conventions
   E. Consumers
   F. Magazines, newspapers, etc.
   G. Analyses of trends in nutrition, living habits, food storage methods, cooking appliances, packaging, selling, and processing equipment
   H. Other food product areas

II. Evaluation of Products

   A. Production

      1. Compatibility of product with existing plant, equipment, and production capacity
      2. New items or modifications, if any, needed for production

         a. Space
         b. Equipment
         c. Power
         d. Labor (including skill level)
         e. Safety requirements

      3. Production stage of product, i.e., pilot plant, lab, etc.
      4. Lead time available
      5. Investigation if co-packer could make more efficiently or economically
      6. Quantity to be produced in relation to time
      7. Ingredient availability, storage, purchasing specifications, and quality control
      8. By-products to be disposed of

   B. Marketing

1. Type of market

    a. Retail direct
    b. Wholesale or retail indirect
    c. Institutional

        (1). Hotel, restaurant
        (2). Military
        (3). Industrial, vending
        (4). Government (U.S. and state)

    d. Export

2. Market potential

    a. Size (geographic and volume)
    b. Competitive products
    c. Consumer test results
    d. Product setting

C. Packaging

1. Specialized equipment needed
2. Materials

    a. FDA approved
    b. Product protection

        (1). External contamination
        (2). Oxygen and light
        (3). Moisture exchange

3. Design, graphics, and color

    a. Meet legal requirements
    b. Compatible with product image
    c. Price marking spot
    d. Pilferage protection
    e. Attractiveness

4. Utility

    a. Sized to proposed consumer needs
    b. Convenient to open
    c. Re-use feature

5. Fits into warehousing and distribution practices (stacking, handling, shelf-space, shipping damage)
6. Production and packaging equipment speed rate synchronized
7. Test extended shelf-life in package

D. Pricing

1. Total cost of product, break-even cost
2. Selling price
3. Relationship to price of competitive products
4. Volume-price relationships
5. Market strength of selling price

III. Quality Control

A. Microbiological
B. Chemical

1. Nutrition
2. Moisture
3. pH

C. Physical

1. Flavor
2. Viscosity
3. Texture
4. Color
5. Appearance

D. Shelf-life
E. Adherence to formulation
F. Weight
G. Sanitation
H. Processing procedures

IV. Advertising and Promotion

A. Promotion plan

1. Expected marketing outlet
2. Identity characteristics of product

B. Media choices

1. Art
2. Copy

V. Legal

A. Product liability coverage
B. FDA

1. Food laws and regulations
2. Fair packaging and labeling laws and regulations

C. USDA

    1. Inspection

        a. Wholesomeness
        b. Standard-of-identity

    2. Grading

D. FTC - trade practices
E. Labor

    1. Occupational health and safety
    2. Minimum age
    3. Minimum wage
    4. Employment practices

F. Patents, Trademarks
G. Weights and measures
H. Local and state laws in areas above.