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PREVIEW

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CHALLENGES TO LONG-RANGE FOOD PROCESSING MANAGEMENT  
PLANNING: THE NEED FOR FOOD ANALOGS AND FOOD EXTENDERS IN  
THE YEAR 2000

*Pace University*

D.P.S. 1983

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PREVIEW

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CHALLENGES TO LONG-RANGE FOOD PROCESSING MANAGEMENT PLANNING:  
THE NEED FOR FOOD ANALOGS AND FOOD EXTENDERS IN THE YEAR 2000

A DISSERTATION  
PRESENTED TO  
THE FACULTY OF THE LUBIN GRADUATE SCHOOL OF BUSINESS  
PACE UNIVERSITY

IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE  
DOCTOR OF PROFESSIONAL STUDIES

MYRON I. PESKIN

1983

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PREVIEW

## ABSTRACT OF A D.P.S. DISSERTATION

This study was undertaken to establish the bases for recommendations to food processing management to aid it in its long-term planning to satisfy the consumer need for fabricated and synthetic foods in the year 2,000 and beyond.

To accomplish this purpose the writer consulted the literature and a variety of informed governmental sources to determine:

- a) the extent to which current world nutritional needs are being met with existing foods; and
- b) the factors which, over the last fifty years have been primarily responsible for the development of today's fabricated and synthetic foods.

Beyond this, the writer attempted to project the trend developed over the past fifty years to the year 2,000, and to use the data so developed to provide the basis for recommendations designed to aid food processing management in its planning for organization to optimally meet the projected needs. To acquire data for this element of the study the writer, through a 25 item questionnaire, solicited informed opinion from authoritative figures in government, food-processing corporations and academia. These data, where appropriate, were amplified by a series of interviews in depth with appropriate members of the responding groups. The data indicated necessity for food processing management to direct

its attention to a number of areas covering the range of food processing technology and marketing. The writer views the future with optimism, on the assumption that a synergistic relationship between government and food processing management will facilitate the answers to many of the real problems confronting that management.

PREVIEW

## ACKNOWLEDGEMENTS

The writer wishes to acknowledge the advice and criticism of his sponsoring committee: Dr. Earl R. Zack, Chairman, who as advisor, leader, intellectual counsellor and friend, was especially helpful in achieving academic excellence; Dr. Thomas P. Robinson, who as instructor and mentor gave freely of his advice in the writer's endeavor toward academic excellence; and Dr. Oscar Nestor, who as teacher, inspirer and friend insisted that the writer continuously strive for academic excellence.

The time spent by Mr. Fred I. Posner and Ms. Pamela Carroll of the General Foods Marketing Research Department, who counseled so professionally on the development, wording and printing of the questionnaire is sincerely appreciated. Without their expert direction, it is doubtful that the response would have been as good as it was. The questionnaire, with the closed and open ended replies received, served as a basis for much of this research study.

An acknowledgement with "thanks" is offered for the comments contributed by the "anonymous six" who participated in the field testing of the questionnaire. Their reactions, which provided the writer with the encouragement necessary to distribute the questionnaire, is sincerely appreciated. The writer is also thankful to all of the anonymous respondents to the survey questionnaire.

A special "thanks" is offered to Representative Benjamin Gilman (R., N.Y.) who is a member of the Presidential

Commission on World Hunger, for his support of this research project and for his efforts on the writer's behalf.

The writer wishes to express his gratitude to Dr. Thomas F. Butler of Pace University for his helpful comments on the methodology which was used in the treatment of data, and for his guidance in the presentation of descriptive statistics.

A note of sincere appreciation is given to Ms. Margaret Bell and Mrs. Phyllis Drap for their professional typing, and to all the unacknowledged individuals who contributed so much to the completion of this research.

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## CHAPTER 1

### THE PROBLEM

#### Statement of the Problem

The problem is to make recommendations to food processing management which will aid them in their long-term planning to satisfy consumer need for fabricated and synthetic foods in the year 2000.

#### Specific Problems

The first problem is to determine the extent to which current world nutritional needs are being satisfied with existing foods.

The second problem is to identify those factors which, over the last fifty years, have been most responsible for the development of today's fabricated and synthetic foods.

The third problem is to project the trend developed over the past fifty years to the year 2000.

#### Definition of Terms

The following definitions, which were taken in part from the 1974 Yearbook of Agriculture, published by the United States Department of Agriculture, will be used for the purposes of this study.

A fabricated food is any food manufactured from agricultural raw materials by a food processor. Fabricated

foods are generally designed to best meet the combined criteria of nutrition, palatability, safety, shelf-life, economy, and convenience. Food analogs and food extenders are examples of fabricated foods.

Synthetic foods are foods whose raw materials are derived by chemical means as opposed to agricultural raw materials.

Food analog is a generic term which refers to any substance, either natural or synthetic, which has most of the characteristics of the food it is used to replace. Three common examples of food analogs are: margarine, which is used to replace butter; saccharin, which is used to replace sugar; and simulated chunks or slices of ham fabricated from textured soy protein with flavors, colors, and nutrients added.

Meat analogs look like and taste like different forms of animal protein such as ham, pepperoni, and bacon. They are intended to be used as replacements for the foods they resemble.

Food extender is also a generic term which, like "food analog," refers to any substance, either natural or synthetic, which has most of the characteristics of the food it is augmenting. A food extender should not be considered an adulterant or a modifier. It is used in conjunction with a particular food to satisfy nutritional needs at an affordable cost. An example of a food extender being sold today is texturized soybean protein being

marketed under such various labels as General Mills' "Hamburger Helper," Lipton's "Make a Better Burger," and Hunt's "Skillet Dinner Extender." The sole use of this texturized vegetable protein is its combination with meat, fish, poultry, and eggs in order to stretch the availability of these foods by 10% to 100% while maintaining the same nutritional value per unit at a lower per unit cost to the consumer.

### Delimitations

This investigation will consider:

1. existing, commercially available food analogs and food extenders, such as protein substitutes, carbohydrate substitutes, and fat substitutes;
2. other fabricated foods, synthetic foods, food analogs, and food extenders which currently do not exist but which are the subject of present research and investigation, and which will, conceivably, be commercially available by the year 2000; and
3. existing North American manufacturing, research, and developmental organizations.

This study was conducted between 1977 and 1980. (Although the closing date of acquisition of data was 1980, the data acquired during the period of research maintain their validity because no changes of substantive importance to the study have taken place.)

### The Need for the Study

Although historically, there has been an abundance

of food in the United States, the availability of this food to lower socio-economic classes has not always been consistent. In fact, C.W. Cook, former Chairman of the Board of General Foods Corporation, commented that, as a consequence of food price trends since 1973, proper nutrition for those in the lowest 25% of the United States income scale had become virtually impossible.<sup>1</sup> In any event, the United States has had an abundance of food and, in addition, has had surpluses which have been used to help feed the world's hungry. However, this oversupply of domestically-produced food has also resulted in lower prices being paid to farmers and cattlemen for their production.<sup>2</sup> Consequently, starting about 1967, there began a migration of marginal farmers and cattlemen from rural to urban areas. During the same period, larger farmers and cattlemen started cutting back on tilled acreage and livestock production.<sup>3</sup>

Then the unexpected happened. Worldwide natural disasters in 1972, in 1973, and again in 1975, coupled with reduced agricultural acreage and reduced livestock production, resulted in a domestic grain and meat shortage for the first time in the United States. During the years

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<sup>1</sup>Douglas N. Ross, Food and Population: The Next Crises (New York: The Conference Board, 1974), p. 39.

<sup>2</sup>Federal Reserve Bank of Chicago, Agricultural Letter, 1968-75, p. 2.

<sup>3</sup>Ibid.

of 1972, 1973, and 1975, grain and meat prices in the United States doubled, and as a result, retail food prices increased by approximately 20%.<sup>4,5</sup>

What we are seeing today in this country is the first indication of the impact that a world food shortage would have on the United States. Actually, what we are seeing today as a new phenomenon was predicted almost two hundred years ago by the English economist, Thomas Malthus. Malthus, in 1798, theorized that the world's population would tend to increase more rapidly than would the world's food supplies and that, eventually, the world's human population would outpace the food supply.<sup>6</sup> Don Paarlberg, Research Director of the United States Department of Agriculture, has said that by the year 2000 we must check our population growth or there will be no solution to the food problem.<sup>7</sup>

Industry Week magazine, in a special study, reported that while the world's population had grown by 2% per year, the rising affluence of a portion of the world's society had increased food demand at an even greater rate. It pointed out that food production at that time could

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<sup>4</sup>Federal Reserve Bank of Chicago, Agricultural Letter, 1968-75, p. 2.

<sup>5</sup>Ross, Food and Population; p. 6.

<sup>6</sup>Thomas Malthus, Essay on the Principle of Population (London: 1798).

<sup>7</sup>Statement by Don Paarlberg, Research Directory, U.S. Department of Agriculture at the Senior Executives Council Meeting, May 30, 1974.

barely satisfy the demand, and that the delicate balance between food supply and demand was being strained.<sup>8</sup>

Obviously, whatever food is used to fill the augmented needs of the world's more prosperous will result in less food being available for the less prosperous.

This interpretation of the balance between food supply and demand is repeated over and over again in a special food study funded by the Conference Board,<sup>9</sup> and at hearings held in Washington by the United States Senate Select Committee Panel on Nutrition and Food Availability.<sup>10</sup>

Along these same lines, Lester R. Brown of the Overseas Development Council has predicted that the growth of population will outstrip the growth of food.<sup>11</sup> C. W. Cook, former President and Chairman of the Board of General Foods Corporation, agrees with Brown that in the very near future the world's food supply might not be sufficient to feed the world's population.<sup>12</sup>

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<sup>8</sup>Joseph N. Spiers, "Feeding the World," Industry Week (November 4, 1974), p. 32-36.

<sup>9</sup>Ross, Food and Population, p. 10.

<sup>10</sup>U.S., Congress, Senate Committee on Nutrition and Human Needs, National Nutrition Policy Study: 1974 - Part 4; Nutrition and Food Availability, Hearing, 93rd Congress, 2nd Session, June 20, 1974 (Washington, D.C.: Government Printing Office, 1974).

<sup>11</sup>Lawrence A. Mayer, "We Can't Take Food for Granted Anymore," Fortune (February, 1974), pp. 85-88.

<sup>12</sup>Ross, Food and Population, p. 39.

In fact, there also appears to be a question as to whether current world food production can adequately feed today's world population. The Chicago Board of Trade reports that the world's demand for food and the world's supply of food are clearly on a collision course, and that any unexpected decline in supply (which could be caused, for example, by unfavorable agricultural conditions) or any unanticipated increase in demand will result in severe worldwide shortages and sharply higher prices.<sup>13</sup>

A study conducted at M.I.T. and funded by the Club of Rome finds that the world's total supply of arable land is about 3.2 billion hectares (equivalent to approximately 8 billion acres,) and that at present agricultural productivity levels, about 0.4 hectare of arable land is required per person for proper nutrition.<sup>14</sup> This information, plus other information obtained during this Club of Rome study is shown on the graph on the following page. The graph indicates that, assuming world population continues to grow at its present rate of about 2.1% per year (doubling the earth's population every 33 years,) and available arable land is reduced because of such necessary urban-industrial uses as housing requirements

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<sup>13</sup>The Soybean Phenomenon (Chicago: Chicago Board of Trade, 1974), pp. 4-14.

<sup>14</sup>Donella H. Meadows and others, The Limits to Growth (New York: The American Library, 1972), pp. 57-63.