MEAT FOR 21ST CENTURY U.S. CITIZENS

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The author reviews and discusses long range problems that the meat industry faces. A greater emphasis should be placed on delivering nutrition.

INTRODUCTION

During the decade of the 1970's, average Americans annually consumed over 230 pounds of red meat, poultry and fish; or in excess of 16 percent of the some 1430 total pounds of food consumed annually per capita.[1] Total meat consumption per capita has enjoyed a steady increase since the 1930's. All three groupings have increased over time, with poultry experiencing the most rapid rate of increase.

There is a production, processing, distribution and consumption system for meat in place (an integral part of the total food distribution system). The current meat system delivers meat to consumers, but has experienced an ever growing list of problems at every stage in the system over the past decade. This condition is not unique to any portion of our total food system.

MEAT - A NUTRITIONAL VEHICLE

Meat currently provides our citizens with major portions of their vitamin B_{12}, Vitamin B_6, niacin, protein, fat and many other key nutritional elements. It also gives us 20 percent of our food energy. There can be little doubt that meat currently plays an extremely important role in providing nutrition to our people.

An important point needs to be made here. Meat, in any form, is not an end in and of itself. It is a means for our citizens to consume some portion of their requirements from a long list of necessary elements. However, when dealing with the long range future, one must face the fact that essential nutritional elements may very well be available from other sources. One must concentrate on delivering nutrition and not on the vehicle of the moment, in this case, meat.[2]

21st CENTURY FOOD SYSTEM OBJECTIVE

To provide overall focus for the discussion, it will be useful to articulate a general objective for the total food system, within which whatever nutritional vehicle that delivers the nutrients now provided by meats must operate in the 21st centruy. One such objective is "to provide adequate supplies of safe, nutritious food and food products with desired service levels at prices that reflect true value to the

United States consumer, at minimum total resource cost."[3]

THE ISSUES

The discussion which follows will have two central points of focus. The first revolves around the future demand for the various nutritional elements now embodied in meat. These are the what? and how many? type questions for "meat" consumption in the 21st century. The second point of focus revolves around the system's mechanics for getting this nutritional vehicle, "meat," produced, processed, distributed and consumed. These are the from where? what form? and how does it get there? type questions.

While the two general points are closely related, they will be treated separately in the interest of clarity.

21st CENTURY DEMAND FOR "MEAT"

1. Introduction

Probably the most physically efficient way to get into the meat business for the 21st century would be for some central authority to plan and implement changes with full legal authority. However, this doesn't fit within our generally understood concepts of the democratic society. So, another way must be found.

In reality, the current system will more or less "bump" down the path, with occasional "shocks" from improved technologies and exogenous factors, and moderating toward the "Status Quo" by existing institutions within the system.

The following will suggest a procedure somewhere between these two poles.

2. Mechanics

The classic method to project the demand for a commodity or group of commodities is to develop some sort of trend based upon past performance. This is fine for a "no change" or "constant rate of change" society. However, it more than likely will not even come close to being adequate in this particular case.

Scenario writing is another method of projecting demand, in which a set of pertinent variables are quantified and demands estimated based upon each individual set of circumstances. The theory is that if you make up enough scenarios, you are bound to hit the right one eventually. The trick to this method is to pick the "most likely case" that indeed will be very close to what will become reality.

There are many more methods of projecting demand, including a number of elaborate mathematical exercises. These again are only as good as the data that goes in them and the degree of accuracy with which the mathematical procedure can duplicate "reality" in the future period.

So much for the "how much" question at the moment. Let's turn our attention to the "what" question for a time.

3. Dietary Goals

The "what" that we are trying to estimate for a future period - 21st centruy, are thenutritional elements necessary for human life currently provided in meat. We are at somewhat of a disadvantage quantitatively speaking, due to the fact that detailed data on exact nutritional requirements, precise amounts by commodity and rates of substitutability, are not in general use or in general agreement by experts at this time.

There are in existance some general sets of nutritional guidelines which we have used for some time. Our basic approach to nutrition in this country has been to "overfeed" and be sure that the person gets plenty of all the necessary nutrients. This luxury, many resource-poor nations don't have. Such an "overfeeding" policy has resulted in some 20 percent of our people being seriously overweight as to impair health and activity.

A series of "dietary goals" were established by the select committee referenced previously and some of them will be used as modifiers to current consumption of meat. These goals are completely voluntary and represent levels we should aim for, not minimum to sustain life. If all the 20 percent of our dangerously overweight people decreased consumption to get back to "normal," then meat consumption would decline. Another goal is to decrease red meat consumption and increase consumption of poultry and fish. Depending on relative rates of decrease and increase, total meat consumption could fall. If we all decrease salt consumption as recommended, meat and fish (especially processed products) are high in salt, meat consumption would go down. Should we all eat more fruits and vegetables and whole grains as recommended, there would be more competition for land for grain to feed meat animals and the price would go up and consumption of meat would decrease. There are many "ifs" and very little quantification of factors when dealing with these "dietary goals." About all that can be said is, if we all met this set of dietary goals, we probably would be eating less meat.

4. 21st Century Life Styles

The various aspects of dietary goals and their impact upon meat consumption serves only to catch us up with present consumption patterns. It says nothing about the dietary patterns necessary for life under the life style of the 21st century. Forecasts have been made that man will be living a much less resource-consumptive, group-oriented life style in 2,000 A.D. and beyond. The precise impact upon meat consumption (essential nutrients embodied there-in) is uncertain. If the information revolution, with electronics becoming a greater factor in our lives comes to pass, as is quite probable, then mankind will require less food energy to survive. He or she may use the balance and move up in the increased leisure or creative activities. We don't know yet, varying scenarios will allow analysis for both alternatives and several other variations as well.

5. Substitutes

Back to the nutritional vehicle question again. What we know as meat now provides us with an array of nutritional elements. Many of these nutritional elements are available in cheese, eggs, milk or other dairy products. Others are available in a long list of traditional foods.

The whole area of "synthetic foods" needs to be considered at this point in the discussion. We already add nutritional supplements to a large variety of our current foods. Synthetic bacon, soybean extender for hamburger are common place. People are experimenting with synthetic protein from plants, oil sludge, and various chemical processes. Who can rule out a breakthrough that could revolutionize the "synthetic meat" business? This will be discussed more thoroughly under the mechanics of the system segment later in the paper.

6. Summary

What have we learned from all this disucssion? For one thing, we know that 21st century demand for meat is not the sum of projected population x the number of all retail cuts presently consumed. But, unfortunately, we know little else of a quantitative nature. What we are trying to point out is that much work has to be done before we can have a series of meaningful scenarios on 21st century "meat demand."

21st CENTURY "MEAT DELIVERY SYSTEM"

1. Introduction

Having discussed the "what?" and "how many?" questions, let's move on to the "from where?," "what form?" and "how does it get there?" questions. The basic framework for the discussion will be the four basic segments of the food industry system - consumption, distribution, processing and production.

2. Consumption

We currently eat one meal in three away from home. With the rapid increase in number of working wives and our busy life styles, there is little to keep us from moving to the 50-50 split which was predicted in 1970.[5] Many of the author's comments made in the "2,000 A.D." paper are pertinent to our discussion and are generally valid today. There have been some technological changes which are positive over the last decade, but very few institutional changes.

The concept of portion control was not new in the 1970's and is not new now. It will, however, have a definite impact upon "meat" delivery systems of the future. As processing and preparation gets pushed further from retail and home level, portion control becomes more important. This could have a negative impact upon meat consumption. If we buy one portion of "meat" per person, then the extra helping may not always be there. This may be good in a dietary sense. It will also help to eliminate loss along the system, except that of "plate loss." This, too, may be reduced if we can gear the size of portion more to dietary needs ... especially in eating establishments.

In the 2,000 A.D. paper, much emphasis was put upon total meals as a unit being handled throughout most of the food industry system. This condition is also growing rapidly. Since it operates on the principle of assemblying portions into a meal unit, this concept reinforces earlier comments on limiting consumption.

Recent advances in "retortable pouch" technology which will usher in the "boil-in-bags" era, also serve to reinforce both the protion control and meal concept. As we deal more and more with standardized units throughout the system, we tend to control consumption - for better or for worse.

Relax, those of you who are extra hungry. Additional portions will surely be available to meet most any needs.

3. Distribution

A. Introduction

The distribution area is the segment of the meat delivery system where the most immediate point of confrontation presents itself. The ready-to-eat portion of the retail food (meat) business--restaurants, fast food, institutions--have pretty we-l solved the portion control and related problems. This group can handle whatever comes along as "meat" regardless of source or composition (within bounds of laws, health codes, and nutritional make-up, of course). The immediate problem area (next 5 years) is in the retail food stores, and the issue is cutting, packaging and merchandising of retail cuts of meat. The longer range point of controversy (mid 21st century) is in the area of grass fed cattle vs. grain fed cattle vs. synthetic meat, which will be discussed under the production segment.

B. Central Processing of Retail Meat Cuts

The issue is the high cost and low utilization of (1) capital--storage, cutting and packaging equipment and (2) people--highly skilled meat cutters, in retail food stores. Moving the job of breaking primal cuts and packaging retail cuts to some central point (area or region) was demonstrated to be economically and technically feasible in the early 1960's.[6] The major impediment--the Amalgamated Meat Cutters Union, the issue was union jobs.

There have been a few medium size retail firms that have implemented central meat processing systems over the past two decades. However, not many have followed. The early problems of sanitation and shelf life have been solved, technology-wise. The item movement problem that plagued the system for years can now be solved by the electronic front-end computer scanning system. The pressure is really on to control cost of meat distribution at retail.

The "meat delivery system," itself is helping to facilitate this movement away from retail cutting of meat. Such practices as box beef, boneless beef, processor packaging of poultry and most recently, boneless pork products would fit easily into a central meat processing system.

In the transport area, more frequent deliveries at retail to minimize storage cost at retail will partially offset this savings in labor and capital cost gained in moving to central processing. Effective physical distribution management can minimize this cost.

C. Special Cuts

For the consumer who will want special cuts of any sort, they will be available, on order, from the supermarket. They may also patronize specialty meat shops to get the items of their choice.

D. Summary

The longer institutional barriers are allowed to hold back the cost of reducing benefits of technology, the greater is the cost increase that must be passed to the consumer in terms of high meat prices. This can make lower cost substitutes (synthetics) and/or decreased consumption of "meat" a more attractive alternative for the consumer of the future.

4. Processing

From the "meat" processor's point of view, the move to central meat processing at retail will extend the current trends mentioned earlier. Basically, he will still be shipping primal cuts plus an increasing volume and variety of retail cuts to the general area of the retail firm. The truck will be dispatched to the central processing plant and assembly point instead of the regional perishable warehouse. In some cases, they might be at the same location.

There will be a tendency on the part of the retailer to order more to demand and push part of the storage function back upon the meat processor. This could very well pub pressure on the processor's storage facilities. It also will require more orderly buying of animals for slaughter and put more pressure on the farmers and ranchers to better schedule their marketings. We may very well see marketing of live animals by contract with compensation on a yield basis as a general practice. This could obsolete the traditional market for cattle, just as has happened for poultry and is happening for hogs. Activity in this area will be moving rapidly in the decade of the 1980's.

The most important impact of central meat processing on the meat processor will be that of getting into the retail meat cut business. This will be especially attractive in market areas within economically feasible travel distance of the processing plants. These admittedly are not currently the large metropolitan areas of both sea coasts. However, energy economics may well change the location of meat production. More on this later. Also, it may be advantageous for selected cuts to be centrally handled at processing locations, similar to what is happening now for the restaurant and institutional food business.

Central in the planning and day to day application of this "meat delivery system" is the electronic based uniform communications system we hear so much about today.[7] The technology has been available for sometime. The advent of computer technology will make widespread application possible and economically feasible. It also is just what the "meat delivery system" needs for functional efficiency.

5. Production

A. Introduction

The farmers and ranchers who produce the meat we consume are currently beset with increasing capital and feed costs, problems with energy--coal and mining companies--in competition for range

land, and water. Also there are broader issues that fit best in a paper of this nature.

B. What to Feed These Animals?

Do we feed these animals grain and grass (used very broadly)? Or do we feed them just grass? Most of the rest of the world has already made this decision. They feed the grain to people and let the animals eat grass or garbage. If we would decide to follow this policy, there would be very serious reprecussions in the broiler, egg and hog business. The dairy business would be hurt, but not as seriously as the others mentioned.

If we are really serious about our "minimum total resource use" concept in the objective on page 21, then we should use the beef animal to harvest plants that man cannot directly consume and feed the grain to man or to more efficient converters--chickens or hogs. This would produce a different beef product than we are presently used to, but just as nutritious--and more healthful with less fat.

The comments on grain vs. grass apply to most current substitutes also. Without grain, the egg, milk, and cheese business will suffer as well.

This grain vs. grass issue is a nebulus "rascal" that, if it comes at all, will come upon us in the middle stages of the 21st century. It is one of those once in an "age" issues that will probably land in the 21st century.

C. Transport

Current and anticipated price increases and/or shortages of petroleum-based energy are causing or threatening to cause serious dislocations in many agricultural industries. Tying this issue to the previous discussion, we would locate the processing plants next to the grass and not next to the grain as they are presently. Then we would have to transport primal cuts and/or retail cust out of the grass areas to the consuming areas. Or we may move people nearer to the producing areas.

D. Environment

For many years, we made great strides in concentrating production of meat animals in fairly small pla-es. This has had certain economies in production, but has caused monumental pollution problems in some cases. The move to grass fed animals would disperse the industry again and could have the side benefit of diluting the animal waste problem.

Some would say this is a step backwards, rather than into the future. Others would say that such a move would be more in tune with anticipated 21st century life style.

E. Synthetics

"Synthetic meats" be they made from plant proteins, petroleum waste, bacteriological activity, chemical synthesis or whatever, are all nutritional vehicles--just as the natural meat they might replace. The rise and fall of anyone of these vehicles is partly based upon economics, tastes, availability of resources and politics.

"Soy-protein" is a commercial reality. Synthesizing protein analogs in a variety of ways has been demonstrated in the laboratory. One of the basic problems that a futurist has in dealing with this issue is the emotional attachment that most people have to the existing nutritional vehicle. Minds are closed and alternatives to the current vehicles are not even considered. Open minds could be the most valuable resource brought to bear upon this problem.

SUMMARY

Well, what have we learned?

1. Meat is a nutritional vehicle, means to an end, neither bad nor good, per se'.

2. Demand for the nutritional element currently embodies in meat will probably be less per capita in the 21st century, how much less and whether less at all needs a lot of work.

3. The "meat" delivery system will:

   a. Get a severe "shock" on the issue of central processing for retail within the next five years.

   b. Get a longer range shock on the grass vs. grain issue sometime in mid-21st century.

4. Portion control will be the common element in the system.

5. The 21st century "meat system" is not incompatible with the computer assisted "information society" of the future.

6. The principle of "minimum total resource use" to deliver selected food products is a useful criteria, but not easy to apply.

7. Much work needs to be done to improve the precision and usefulness of dietary goals.

8. Synthetics and substitutes should challenge us rather than scare us into the "head in the sand" syndrome.

9. Contract production of beef and pork on a large scale is coming before 2,000 A.D.

10. Transport costs will seriously impact upon production and processing location decisions over the next 20 years.

Opportunities abound as "spaceship earth" tries to find its way along toward the 21st century. The "meat industry" has a series of long range problems to solve--not unlike the rest of the food industry or the total economy as well. Viewed in the broader perspective, attacked with long range tools and solutions, these problems are not unsurmountable. Where do we start? Pick a problem, define some objectives; marshall appropriate resources; take action; evaluate and feed back. Familiar tools that will serve us well when placed in the hands of people with vision and courage.

FOOTNOTES

[1]"Food Consumption, Price and Expenditures," ESCS, USDA, Statistical Bulletin No. 656, February 1981.

[2]"Nutrient Delivery System - A Human Feeding Concept for 2000 A.D. and Beyond," J. L. Cain, Journal of Food Distribution Research, Vol. IV, No. 3, September 1973.

[3]"United States Food Policy - Toward 2000 A.D.," Jarvis L. Cain, Journal of Food Distribution Research, Vol. IX, No. 3, September 1978.

[4]"Eating in America: Dietary Goals for the United States," Select Committee on Nutrition and Human Needs, U.S. Senate. January 1977.

[5]"The Food Industry 2000 A.D. - Revisited," J. L. Cain, Journal of Food Distribution REsearch, Vol. II, No. 1, September 1971.

[6]"Centralized Processing of Fresh Meat for Retail Stores," Voltz, et al, USDA, October 1963.

[7]"Managing Growth in the 1980's: Toward a New Economics," R. D. Hamrin, Praeger, 1980.