Options for Making Animal Products Part of a Leaner Diet

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Animal products—meat, fish, dairy products, and eggs—provide Americans with food energy (calories), protein, and many essential vitamins and minerals. However, they have also been implicated as a major source of fat and cholesterol. They contribute more than half the total fat, three-fourths of the saturated fatty acids, and all the cholesterol to our food supply, according to a report by the National Research Council (NRC), an arm of the National Academy of Sciences.

Based on dietary recommendations from national health organizations, the Council compiled target levels for caloric intake and nutrients *(table 1)*. The NRC then evaluated how well the U.S. food supply matched these target levels between 1965 and 1985. It found that, overall, Americans consume too much fat. Consumption of some reduced or naturally low-fat animal products, such as low-fat milk and fish, rose. But we have also been eating more high-fat foods, like hard cheeses and baking and frying fats. Consumption of processed foods and meat mixtures—entrees containing one or more types of meat, poultry, and fish—also increased, reflecting a preference for foods with less preparation time. Another interesting trend was the shift from eating less visible, separable fats, like the fat trimmed from a steak, to more invisible fats, such as those found in baked goods, prepared entrees, and carry-out foods.

Because some people in the United States today eat too much fat, saturated fatty acids, and cholesterol—while others fail to get enough iron, calcium, and calories—the NRC recommends various options for improving the nutritional value of animal products *(see box)*, which it defines as all foods derived from animals.

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Table 1. Target Levels for Calories and Nutrients Are Based on Recommendations from Major National Health Organizations

Item	Recommendation
Calories	Intake matched to individual needs and appropriate to achieve and maintain desirable body weight
Calories from:	
Fat	30 percent or less for adults
Saturated fatty acids	10 percent or less for adults
Polyunsaturated fatty acids	10 percent or less for adults
Monosaturated fatty acids	15 percent or less for adults
Cholesterol	300 milligrams or less per day for adults
Calcium	The Recommended Dietary Allowance (RDA) for a person's age and sex
Iron	The RDA for a person's age and sex

Evaluating Animal Products

In January 1985, USDA requested the National Research Council, part of the National Academy of Sciences, to examine new animal product technologies in the marketplace. The Council's Board on Agriculture was specifically asked to:

- Identify dietary targets for nutritional characteristics of animal products, based on recommendations from national health organizations.
- Quantify current consumption patterns of animal products.
- Assess current options available to consumers and existing technologies to alter the characteristics of animal products.
- Develop a strategy for constructive change consistent with contemporary dietary recommendations.
- Develop a strategy to foster widespread adoption of economical and practical innovations.

The Committee on Technological Options to Improve the Nutritional Attributes of Animal Products convened to accomplish these objectives. After several hearings and workshops to gather information, the report, *Designing Foods—Animal Product Options in the Marketplace*, was issued in April 1988.

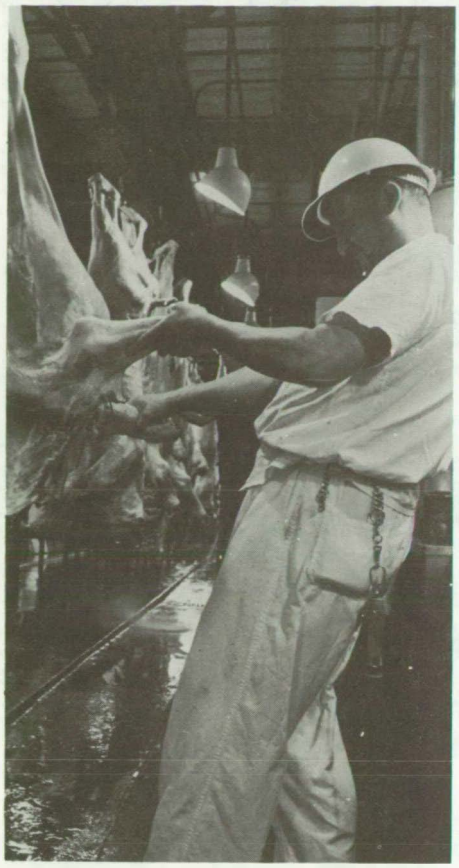
Policy Recommendations

The NRC has a number of suggestions for developing new policies and changing old ones to encourage nutrition educa-

tion, the growing array of low-fat products, and other positive trends it found among consumers and in the animal products industries.

Grading. The Council supports USDA's change in the name of one of its beef quality grades. Effective November 23, 1987, the Good grade name was changed to Select to give the beef industry an opportunity to improve the marketing of beef containing less marbling than found in Prime or Choice, and to provide consumers with leaner graded beef. According to the Council, in the past most beef was presented to USDA for grading, but packers often only allowed carcasses that graded Prime or Choice and yield 1, 2, or 3 to be rolled with the official grade stamp. Packers marketed the ungraded beef as a single carcass type called "no-roll" beef (carcasses without an official grade stamp rolled onto them). One possible reason for this, as the NRC points out, is that "over the years, lower quality grades have come to signify inferior quality, although they are often leaner, a factor side-stepped to some extent with the no-roll designation."

USDA grades beef carcasses for quality (flavor, juiciness, and tenderness) and yield (the cutability or yield of trimmed cuts from the carcass). Intramuscular fat (marbling) and maturity are the main determinants used in the eight quality grades: Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner. Heavier marbling receives a higher quality grade, Prime or Choice, because many consider these grades to be more flavorful, juicy, and tender when cooked. Yield grading is based on the lean-to-fat ratio. The more external, seam, and body-cavity fat on the carcass, the lower the yield grade. Lower grades are designated with a higher number, 4 or 5 versus 1, 2, or 3.



USDA grades beef carcasses for quality and yield.

In order to present consumers with leaner meat products, the Council recommends that hot-fat trimming (removing subcutaneous fat immediately after slaughter and before chilling) be given serious consideration. Removing fat at the earliest possible moment reduces transportation costs and encourages efficient use of by-products. To do this, though, USDA grade standards would have to change to uncouple the yield and quality grades. (Currently, carcasses must be marked for both yield and quality, if either is done.)

Beef is graded after carcasses have been chilled. Because yield and quality grades are coupled, carcasses that were hot-fat trimmed cannot accurately be yield graded because much of the external fat has been removed. They are, therefore, ineligible for quality grading.

If grades were uncoupled, packers who use hot-fat trimming could have their carcasses quality graded without having them yield graded. Other packers who wanted to continue assigning both yield and quality grades could do so. Uncoupling would also allow no-roll beef to be yield graded.

USDA published a proposal in the *Federal Register* on February 3, 1988, to separate beef quality and yield grades. USDA received comments on the proposed rule through June 6 of last year. A final decision will be announced soon.

Labeling and standards of identity. According to the Council, "information on the label, or as conveyed by standards of identity, is a basic starting point for consumers wishing to exercise informed choices in the marketplace." On this premise, the Council recommends several changes. First, cholesterol labeling should be encouraged so that Americans concerned about the substance can lower their intake.

Second, use of the term "Natural" for meat products should be standardized. Some processors and retailers use the term for products from animals that were not exposed to drugs, hormones, feed additives, or other chemicals. Others use it when referring to meat from animals raised in open spaces (as opposed to feedlots) and fed forages instead of grain. The NRC cautions that care should be taken when deciding the meaning; in no way should the term suggest that products not designated "Natural" are unnatural or unhealthy.

Third, the terms "Light," "Lite," and "Lean" should be restricted to retail products. These descriptive adjectives are now used at retail, even though leanness is determined by looking at the whole carcass. The Council cautions that this determination should not be simply carried over from the carcass to the retail item, as is often done. For instance, a piece of meat from a lean carcass that was not trimmed may contain more fat

than another cut from a fatter carcass that was trimmed closely at the retail level. Objective standards for leanness of the cut should be required if these terms are used at retail.

The fourth recommendation suggests a reduction in the number of Federal identity standards. Standards of identity list an established range of mandatory ingredients for certain foods—like mayonnaise, frankfurters, and bologna—that do not have to appear on the product label. The Council also suggests eliminating all restrictions on specific ingredients and manufacturing processes beyond those needed to maintain a standardized food's recognizable characteristics. This would enhance the industry's ability to market new products. Some identity specifications are very restrictive. For example, in some cases, food manufacturers are unable to replace high-fat or high-cholesterol components with nonfat or low-fat ingredients and still market products under their original names. Low-fat and low-sodium cheeses cannot legally be called cheese.

Point-of-purchase information. A wide range of marketplace options allow consumers flexibility in matching products to their dietary and lifestyle needs. According to the Council, nutritional labeling is an important step, but additional information provided at the point of purchase—pamphlets and information tags, for example—would allow consumers to make more informed decisions. Point-of-purchase information could also help consumers understand new low-fat products. The NRC recommends the exemption of point-of-purchase programs from Food and Drug Administration regulations that require complete nutritional labeling on all written materials accompanying a product if any nutrition information is provided. For instance, specific guidelines outlining ways to provide factual nutritional data could be issued. The Council also encourages restaurants to provide their customers with point-of-purchase information.

Data sources. As point-of-purchase and other information programs evolve, the NRC emphasizes that credible and accessible data are essential. To provide this information in a consistent manner, the Council suggests that all Government food data banks be periodically reviewed by an oversight group and consolidated when appropriate. The NRC says that food retailers and processors should be involved in the process to ensure the data meet the needs of the marketplace. As part of the consolidation process, standards for serving sizes should also be set.

Advertising and promotion. The Council recommends that the various animal product industries develop guidelines that restrict or eliminate misleading advertising and claims that specific foods can cure or prevent disease.

Nutrition education. Government has a dual role in the United States: it must communicate nutritional information to consumers and relay scientific research and market trends to producers. Because of many of the conflicting claims made in the field of nutrition, government agencies play a role in establishing the basic facts for both consumers and producers. The Council recommends that these agencies try to reach a consensus on nutrition and health issues.

The NRC also suggests the Government coordinate an effort to dispel dietary myths held by consumers. As the NRC points out, people should not avoid animal products as a way of reducing their fat intake. Many of these foods contain essential nutrients, and nonanimal substitutes may contain just as much fat.

Integrated research and education programs. Many government agencies, private organizations, and producer groups fund or conduct agricultural research. To minimize duplication and waste, the Council suggests that these and other groups work together in a total food systems approach—covering biological and physical sciences, social and behavioral sciences, economics and commerce, and public health, ecology, safety, law, epidemiology, and biometry.

Regulations and biotechnology. Government policies that could inhibit implementation of new technologies should be evaluated. According to the NRC, the United States must maintain its high quality and safety standards for food, but the Council warns that research and development initiatives are being held back because of overly stringent regulations and an unwillingness to accept research data from other countries. A responsive regulatory policy that does not inhibit creativity or innovation would help.

Research Options

In addition to the various policy recommendations, the Council suggests a number of research initiatives. Although current production and processing technologies provide ample opportunity for reducing the fat content of animal products, the Council says more research is needed. Some processes are now being used, but others have not yet been adopted because of high costs, lack of demand, labeling standards, or product stability. These areas also warrant further investigation.

Suggestions for research on production technologies include:

- Improve methods used in determining the fat and protein content of live animals and of carcasses. Over 30 techniques exist to estimate composition. However, these must be improved and made less expensive and more practical. Of the many

techniques that can be used on live animals, ultrasound may have the greatest immediate practical potential.

- Alter the fat content of milk and the lean-to-fat ratio in meat through breeding, nutrition, and management.
- Change the fatty acid composition of meat, milk, and eggs through dietary or genetic manipulation. One major problem with this is that the shelf life decreases if the fatty acid profile is shifted too far toward polyunsaturated fatty acids.
- Identify cellular and molecular mechanisms that turn feed nutrients into meat, milk, and eggs. With this information, bioregulation and genetic engineering could be more effectively applied.
- Determine the extent of genetic variation in the cholesterol content of meat, milk, and eggs. This information could help decide if genetic selection or engineering could be used to develop lower cholesterol animal products.
- Determine whether oxidative rancidity (a form of spoilage) of animal products can be reduced through special feeding or management practices. Research is also needed on other natural or approved synthetic compounds that may extend product shelf life.
- Develop more cost-effective methods for producing low-fat animal products through integrated production management systems.
- And expand reproductive physiology research to permit rapid selection and propagation of superior animals.

There are also many technologies available that reduce fat after slaughter or during processing. However, these methods are not without costs and they usually change product characteristics like texture, flavor, or shelf life. In some cases, these methods may also require regulatory and labeling changes. To promote fat reduction after slaughter, the NRC suggests that the animal product industries:

- Use physical methods to reduce fat at the earliest possible stage in processing. Trimming meat and centrifuging milk to produce low-fat milk are examples.
- Use nonfat or low-fat substitutes to simulate the texture and other properties of fat. Certain polysaccharides and proteins could be used in a number of products if labeling standards were more flexible.
- Adopt standards of identity that reflect today's technologies and consumer needs.
- Reduce oxidative rancidity to extend product shelf life. Certain packaging techniques and approved antioxidants can help minimize this problem in some animal products.
- Alter the fatty acid composition of processed animal products by replacing saturated fatty acids with unsaturated ones. When doing this, product stability and shelf life must be considered and controlled.
- Improve the analysis of quality characteristics of animal items.
- Use molecular genetics and other biotechnologies to improve fermentation processes that are important in the manufacture of products like cheese, yogurt, and sausage. For example, a new microorganism might reduce the cholesterol content of these items.
- Determine how selective extraction of saturated fats and cholesterol could reduce these components in animal products.
- Search for ways to reduce or replace sodium in manufactured animal-based foods. Because salt is such an important ingredient in many processed animal products—providing flavor and delaying microbial growth—the consequences should seriously be considered before implementing any new process.

Animal products have always been an integral part of the American diet. All of the Council's various recommendations are aimed at improving the composition of these foods—whether by reducing fat or increasing nutrient availability. ■

Reference

Designing Foods—Animal Product Options in the Marketplace. National Research Council, National Academy Press, Washington, DC, 1988.