Part VI

POSSIBLE FUNCTIONS OF A FEDERAL RETAIL FOOD GRADING SYSTEM

Part VI

Possible Functions of a Federal Retail Food Grading System

The discussion thus far has brought issues surrounding food grading into focus. This section addresses what the role of Federal food grades could beat the retail level. First, problems in obtaining consumer input on the subject are discussed, exemplifying the difficulties encountered in determining exactly what kind of retail grading system consumers want. Next, because the issues differ from one food group to another, a separate section is presented for each major food category: processed foods, fresh fruits and vegetables, and fresh red meat. Each section covers the present status of both Government and private industry programs, the potential function of Federal retail grades in light of these programs, and the potential impact of changing the present Federal grading system to a more consumer-oriented one.

OBTAINING CONSUMER INPUT FOR THE DESIGN OF A Retai GRADING SYSTEM

User input for designing a system is highIy desirable. For a retail grading system this involves consumer input. In order to obtain consumer input the most common method employed is consumer surveys.

Two types of situations need to be defined in assessing useful output from surveys of consumer views, preferences, and opinions. The first situation is where the consumer is aware of the topic being surveyed and has "preformed" views and opinions. In this situation, consumers are not asked to think or analyze. The interview process simply inventories attitudes already developed and formed. Surveying preformed attitudes, opinions, or preferences is relatively easy, straightforward, and inexpensive.

Useful output from consumer surveys becomes more difficult, however, when the topic of the inquiry is one with which consumers are generally unfamiliar and therefore they have no preformed orderliness or position. In this situation the interview process may be asking the consumer to do the impossible, Consumers are being asked to give information they do not have. They have only what was given to them by the interviewer. If the proposition is presented so that it is absolutely sterile of value judgments, they may find it very difficult to analyze and say what their feelings or views are. On the other hand, if the proposition is laden with values, the interviewer is very likely to get back those same values or opinions.

Consumer input in the design of Federal retail grades is an example of the second situation. Experts have considerable difficulty conceptualizing the operational mechanics and user implications of retail grades. It may be naive to expect consumers to efficiently and directly advise on how to design such a system that would operate effectively.

Individual consumers desire accountability from the food distribution system. Accountability means that someone, including public representatives as well as private firms, is

paying attention to important matters such as nutrition and safety. Even though individual consumers may not use information such as nutritional labeling routinely as a purchase aid, consumer groups may give careful surveillance to nutritional quality in general and specific terms. The individual sees it as a symbol that this issue is being addressed. Thus, although individual consumers may not possess strong opinions concerning the specifics of retail grades, a more general desire for accountability of the system exists among consumers. For further elaboration on this topic see appendix D.

ASSESSMENT BY MAJOR CATEGORIES

Processed Foods Sector

Present Status of Government Programs

USDA Grading System: The present grading system for processed foods is authorized under the Agricultural Marketing Act of 1946. A processed food is defined as any fruit, vegetable, or other food product which has been preserved by any recognized commercial process, including, but not limited to, canning, freezing, dehydrating, drying, the addition of chemical substances, or fermentation.[1]

The current grading system is voluntary/mandatory and designed to facilitate wholesale transactions without the necessity of onsite inspection, but in some cases the grade appears on the retail package. Grades have been established for canned fruits and vegetables, frozen fruits and vegetables, and dairy products. The grades establish criteria for differentiating these products according to sensory differences. The main criteria for these are color, uniformity of size or shape, flavor, texture, maturity, and number of defects.

Grade designations for processed foods lack uniformity. Designated grades of selected products of canned fruits and vegetables, frozen fruits and vegetables, and dairy products vary substantially (table 4). For most grades of fruits and vegetables there are two sets of nomenclature. For example, either U.S. Grade A or U.S. Fancy can be used to designate the top grade of all processed fruits and vegetables. For the second, third, and fourth grades the nomenclature is not uniform. In some products such as orange marmalade, the second grade is U.S. Grade B or U.S. Choice, while another product such as canned squash has as the second grade, Grade C or U.S. Standard. In the third grade the nomenclature can be either U.S. Grade/U.S. Standard, as the third grade of green olives, or substandard, as the third grade of canned squash. Dairy products, a separate classification, have a nomenclature radically different from the fruit and vegetables nomenclature.

Wholesomeness and Safety Programs: The Food and Drug Administration (FDA), in coordination with the U.S. Departments of Agriculture and Commerce, exercises regulatory control over all processed food products through the authority provided in the several Acts administered by these agencies and departments of the Federal Government. Figures 9, 10, and **11 show Federal Government agencies involved in food programs.**

The Food, Drug, and Cosmetic Act and the Fair Packaging and Labeling Act are the basic Federal food laws of the country and apply to all foods, food ingredients, and packaging that are offered for sale in interstate commerce. These two Acts and the regulations issued under them are intended to assure that foods are safe, wholesome, and nutritious; labeled truthfully; and packaged so that deception relative to quality and quantity of package contents is precluded. The Food, Drug, and Cosmetic Act is both a safety and labeling act, whereas the Fair Packaging and Labeling Act addresses labeling and packaging only.

The Public Health Service Act provides authority for controlling the safety and wholesomeness of food and drink served aboard interstate common carriers and for controlling the sanitary operations of establishments that prepare food intended for

[1] U.S. Government. *Code of Federal Regulations, 7 CFR,* 52.1, p. 39.

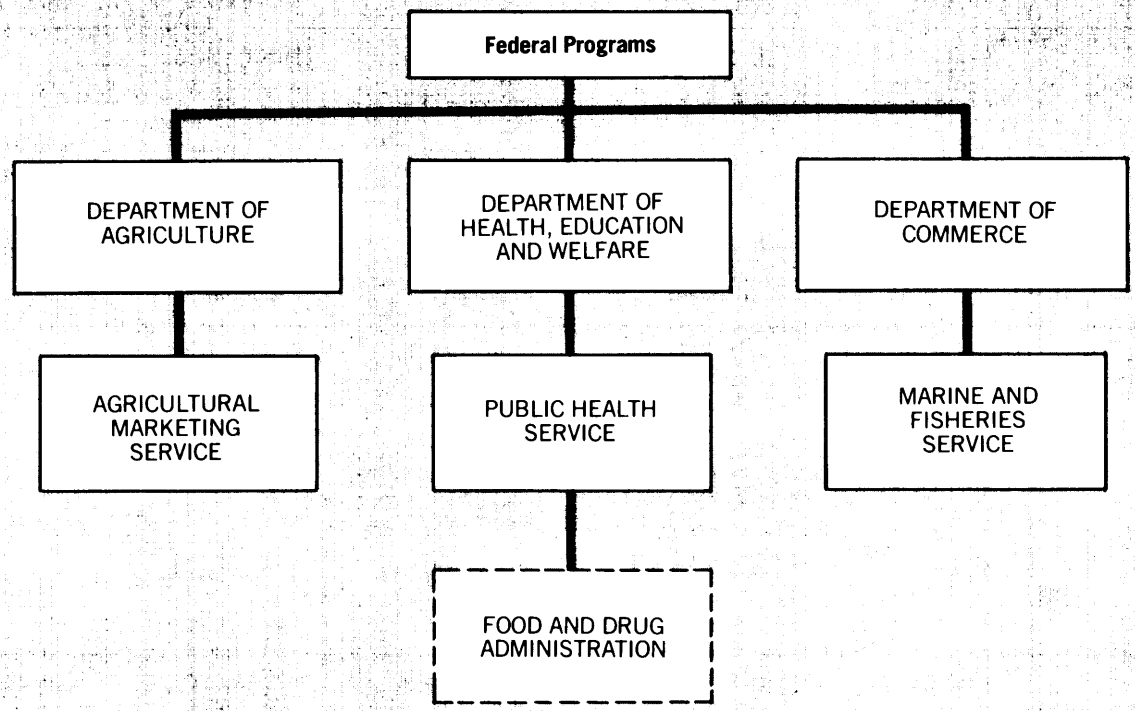
Table 4.

Selected USDA Grades for Processed Food Products

Product Group	Product	Grade Nomenclatures			
		Top Grade	2nd Grade	3rd Grade	4th Grade
Canned Fruits	Fruit Cocktail	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Choice	Substandard	
	Orange Marmalade	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Choice	U.S. Grade C or U. S. Standard	U.S. Grade D or Sub-standard
	Green Olives	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Choice	U.S. Grade C or U. S. Standard	Substandard
Canned Vegetables	Tomatoes	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Standard	Substandard	
	Peanut Butter	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Extra Standard	Substandard	
	Squash	U.S. Grade A or U. S. Fancy	U.S. Grade C or U. S. Standard	Substandard	
Frozen Fruits	Apricots	U.S. Grade A or U. S. Fancy	U.S. Grade B or U.S. Choice	U.S. Grade C or U. S. Standard	Substandard
	Cranberries	U.S. Grade A or U. S. Fancy	U. S. Grade B or U. S. Choice	U. S. Grade C or U. S. Standard	
	Concentrated Orange Juice	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Choice	Substandard	
Frozen Vegetables	Lima Beans	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Extra Standard	Substandard	
	Peas	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Extra Standard	U.S. Grade C or U. S. Standard	
	French Fried Potatoes	U.S. Grade A or U. S. Fancy	U.S. Grade B or U. S. Extra Standard	Substandard	
Dairy Products	Butter	U.S. Grade AA	U.S. Grade A	U.S. Grade B	
	Cheddar Cheese	U. S. Grade AA	U.S. Grade A		
	Instant Nonfat Dry Milk	U. S. Extra Grade	U.S. Standard		

SOURCE U *S* **Government,** *Code of Federal Regu/at/ens, 7* **CFR 52206, Washington, D C, 1976**

Figure 9.
Federal Government Agencies Active in Food Programs



SOURCE: Office of Technology Assessment.

service aboard interstate common carriers. In addition, the Public Health Service Act provides for assistance to the States in the control of communicable diseases transmitted through food and water, and with this authority FDA maintains Federal-State cooperative programs directed toward maintaining safety and wholesomeness of milk, shellfish, and food served in restaurants.

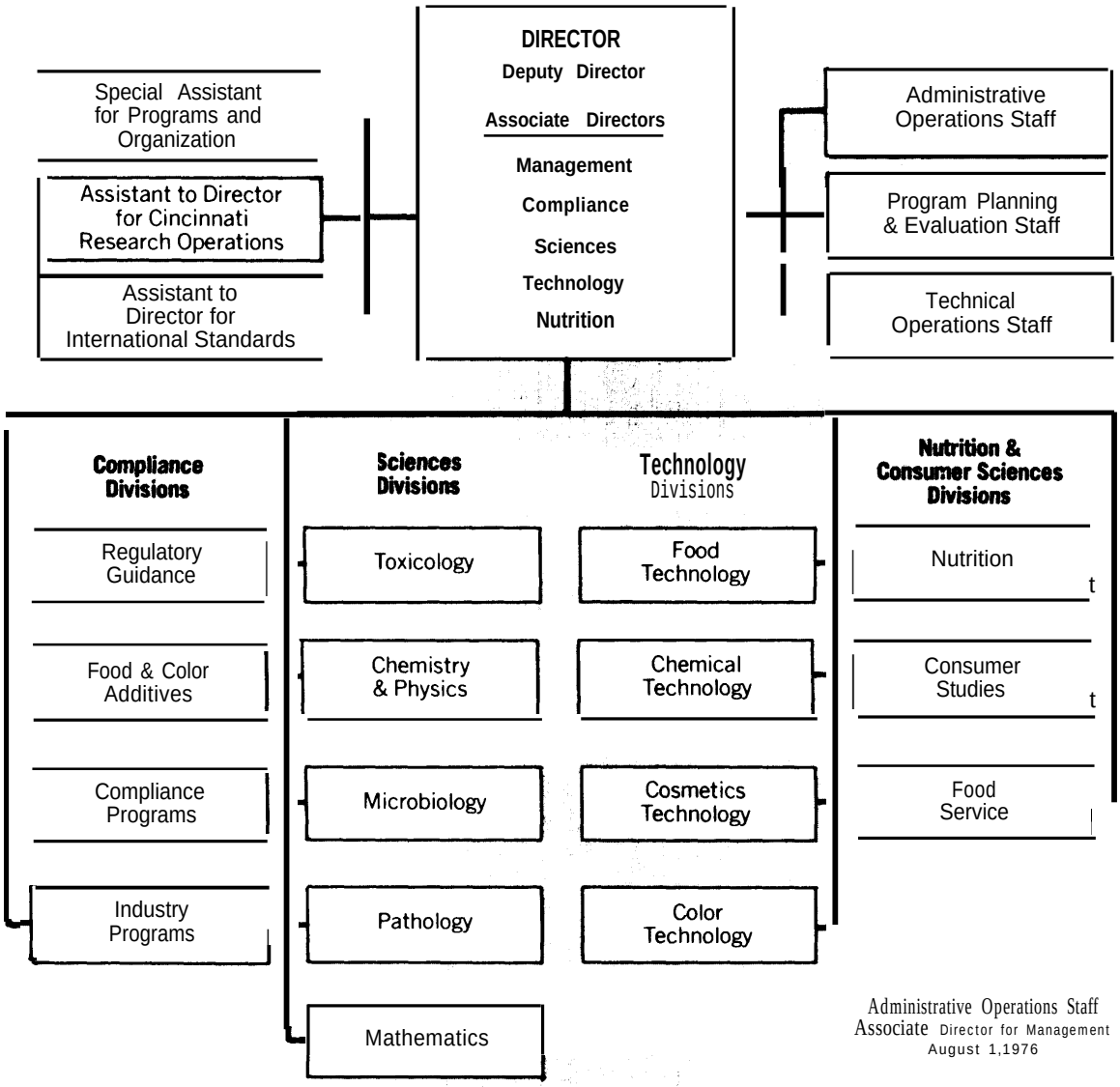
Under the statutes FDA performs inspections of food-processing establishments, warehouses, and distribution systems, and as appropriate, collects samples of products for laboratory analysis to determine that the standards, guidelines, tolerances, and labeling specifications for the products are being met. Imported foods are inspected at dockside and are not released by the Customs Office for entry to the United States until FDA has ascertained that the product meets Federal law requirements.

Certain products, by virtue of their inherent nature or because of the preservation process applied, have greater risk of rapid microbial development that cause human illness. These products and processing establishments are considered high risk and inspected with greater intensity, comprehensiveness, and frequency than establishments processing products in a lower risk category. Examples of high-risk products and establishments include milk, fish, meat, low-acid canned foods, filled pastries and ready-to-eat entrees that require no further cooking.

The inspection tool for the high-risk areas is the Hazard Analysis Critical Control Point (HACCP) inspection designed to identify hazards associated with the product or proc-

Figure 10.

U.S. Department of Health, Education and Welfare--Public Health Service, Food &thug Administration--Bureau of Foods



SOURCE: Department of Health Education, and Welfare-Food and Drug Administration.

ess. In addition to the comprehensive HACCP inspections, other inspections are conducted to record general housekeeping procedures, sanitary operations, control over filth and other defects, and adherences to standards, labeling requirements, food additive tolerances, and good manufacturing practices.

Standards of Identity: The Food, Drug, and Cosmetic Act also provides that standards of quality, identity, and quantity may be established when in the judgment of the Secretary of Health, Education, and Welfare such standards will promote honesty and fair dealing in the consumer interest. So far as is

Figure 11.

Food and Drug Administration Programs Directed to Control of Food and Cosmetics as Authorized by Various Federal Acts

Agency Program	Projects Within Agency Program	Objectives of Projects	Authorizing Act
FOOD SAFETY	Food Sanitation Control	**Inspect establishments** for compliance with regulations, guidelines, standards, etc., and take corrective regulatory action.	Import Tea Act **and FD&CA**
	Chemical Contaminants	Establish safe guidelines and tolerances for industrial chemicals and heavy metals in foods. Regulatory action against products not meeting tolerance or guideline.	FD&CA
	Mycotoxins and Other Natural Poisons	Establish safe guidelines and tolerances for mold toxins (aflatoxins) and plant poisons (solanine in potatoes) in human food and animal feed.	FD&CA
	Food and Color Additives	Process food and color additive petitions and GRAS affirmation petitions for denial or approval of requested safe conditions of use and cyclically review all previously approved substances added to food.	FD&CA
	Quality Control	Promote the adoption and use by industry of quality assurance practices in manufacture and encourage participation in the FDA Cooperative Quality Assurance Program.	FD&CA
	Nutrition	Promote use of sound nutritional principles by public, determine compliance with nutritional labeling, establish regulations for food fortification and regulations for foods for special dietary purposes, regulate micronutrient uses, regulate nutrient quality of new foods (plant proteins).	FD&CA
	Milk Safety	Provide for the safe production, distribution and retail sale of Grade A pasteurized milk and milk products through assistance to the States and through the continuous updating and publication of the Pasteurized Milk Ordinance and Code; administer the interstate Milk Shippers Agreement.	FD&CA and PHSA
	Shellfish Safety	Provide for the safe growing, harvesting, processing and sale of bivalves through assistance to the States and through administration of the national, cooperative industry, state, federal National Shellfish Safety Program.	FD&CA and PHSA
	Food Service	Improve hygienic practices and food protection measures used in the more-than 500,000 food service establishments through assistance to the States and through publication of the Food Service Sanitation Model Ordinance and Code.	FD&CA and PHSA
	Interstate Travel	Prevent the spread of communicable diseases by controlling the safety of food and beverages served aboard interstate carriers and wastes discharged from such carriers.	FD&CA & PHSA
FOOD ECONOMICS	Food Economics (Food Labeling and food standards)	Prevent misleading label statements, fraudulent filling and weight declaration practices, misleading packaging, and degradation of product in the marketplace through ingredient labeling regulations, regulations for standards of identity, quality and fill of container, and regulations for slack fill.	Import Tea Act, FD&CA, and FPLA
COSMETICS	Cosmetics	Remove from the marketplace cosmetics-and cosmetic ingredients that have been demonstrated to be harmful to consumers.	FD&CA
ANIMAL DRUGS AND FEEDS	Safety of Animal derived human foods	Review New Animal Drug Applications and applications for additives to animal feeds to assure that unsafe residues of the drugs or additives are not present in the edible tissues of animals.	FD&CA

SOURCE: Department of Health, Education, and Welfare-Food and Drug Administration.

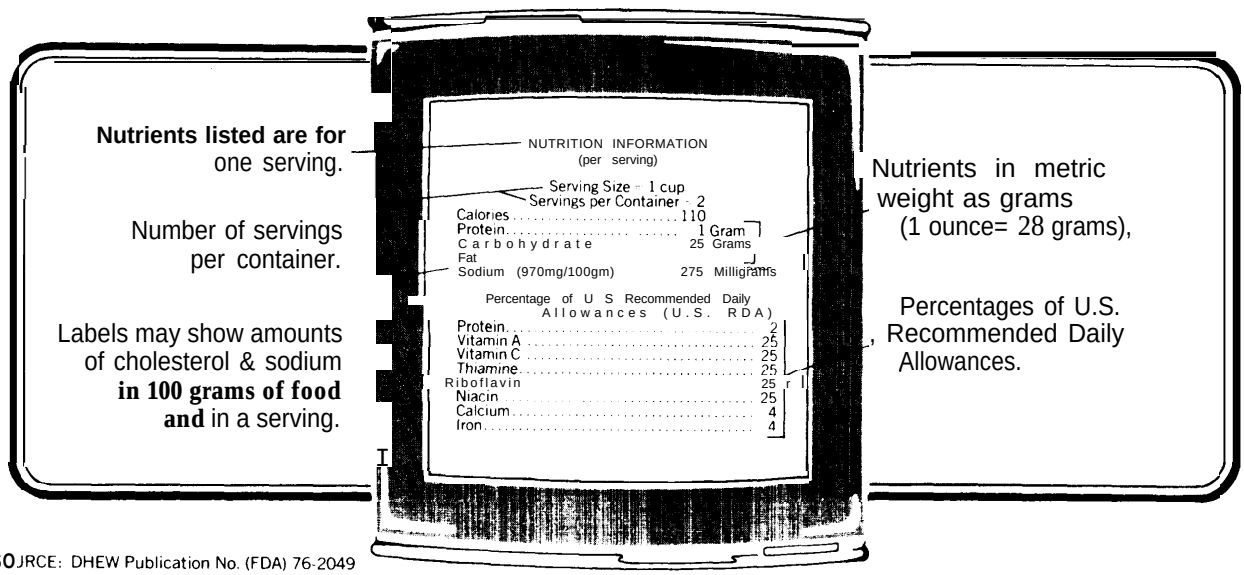
practical, such standards are established under the common or usual name of such foods. Presently, approximately 400 foods have been standardized by regulation under this authority.[2] Some food for which standards have been promulgated include bread products, canned fruits and vegetables, dairy products, nut products, fish products, and jams and jellies.

Food standards mean that for a food product to be sold legally under its common or usual name, it must be made in accordance with certain specifications. The promotion of honesty and fair dealing on behalf of the consumer is accomplished through preventing product degradation in the marketplace. Egg bread, for example, cannot be labeled as egg bread unless it contains a minimum quantity of eggs stipulated in the standards.

Food standards are not only developed in the United States but are also being developed internationally. Codex Alimentarius, translated freely as code of food standards and regulations, is a collection of internationally adopted food standards drafted and presented in a uniform manner. Such standards attempt to protect consumer health by insuring wholesome, acceptable foods, and to promote fair practices in world food trade. Publication of the standards also is intended to harmonize food definitions and requirements in different countries and, in doing so, facilitate international trade. Codex standards eventually will be developed for all principal processed, semi-processed, and raw foods that go in distribution channels for human consumption.

Nutritional Programs: In 1973, FDA announced the Food Nutrition Labeling Regulations, which provided for the voluntary declaration of the calorie, protein, carbohydrate, and fat content and the percentage of U.S. Recommended Daily Allowance (RDA) for protein and seven vitamins and minerals in each processed products. The Food and Drug Administration has established a standard format for the nutritional labels, which include the following items: 1) serving size, 2) servings per container, 3) calorie content, 4) protein content, 5) carbohydrate content, 6) fat content, and 7) the percentage of U.S. Recommended Daily Allowances (RDA) for protein, vitamins, and minerals in each serving (figure 12). Nutrition experts, scientists, doctors, home economists, and industry and

Figure 12.
Nutritional Labeling



SOURCE: DHEW Publication No. (FDA) 76-2049

[2]Dr. Robert Angelotti, *Overview of FDA Food Control Programs,* paper presented at the 36th Annual Meeting of the Institute of Food Technologists, June 7, 1976.

consumer representatives all had input into the development of regulations for nutritional labeling.

Nutritional labeling is designed to provide specific and meaningful information on the identity, quality, and nutritional value of a wide variety of foods to consumers. In addition to the nutrient, vitamin, and mineral labeling required on the FDA-designed format for labels, fats and cholesterol content is shown. The regulation also sets standards for vitamins and minerals sold as dietary supplements and rules for the definition and labeling of imitation food products.

The number of foods that are required to have nutritional labels is limited to only those products fortified by addition of a nutrient or those for which a nutritional claim is made in the labeling or advertising of that food. For most foods nutritional labeling is voluntary, but if processors want to nutritionally label their products, then they must conform to these standards. The voluntary program has been adopted by most large processors, and a significant volume of processed food is currently nutritionally labeled.

Nutritional claims include any references to protein, fat, carbohydrates, calories, vitamins, minerals, or use in dieting. Any such reference makes labeling mandatory. Products marketed as "enriched" or "fortified" also require full labeling. Such items include enriched bread and flour, fortified milk, fortified fruit juices, fortified breakfast cereals, and diet foods.

Present Status of Private Sector Programs

Quality Control Practices in Manufacturing: All processing plants have a quality assurance system to assure that the food products manufactured and shipped are not adulterated or misbranded within the meaning of the Food, Drug, and Cosmetic Act and the Agricultural Marketing Act of 1946. According to Dr. Elaine Wedral, Director of Research and Development, Libby, McNeill, and Libby:

> **We have grade specifics for our own company for, say, fruit cocktail that is ten pages long, These regulations are much tighter than the** USDA standard of grading specifications for fruit cocktails

The basic elements of a quality assurance system include:[4]

- Ingredient inspection and control, which requires testing against written standards.
- Manufacturing control, which requires that hazards be identified and critical control points be established and that these be monitored with the resulting actions duly recorded.
- Distribution control, which requires not only that the integrity of the finished product be protected from the environment in which it is shipped but also that the finished product as sold be unadulterated and properly labeled.

To achieve this system requires a detailed program. These programs may differ among companies. The following is a typical program used by the Pillsbury Company's businesses to assure product safety and regulatory compliance.[5]

1. Product Safety **Analysis.—A product safety analysis must be performed on every new, existing, or modified food product offered for consumption or use. Each business' research and development department has the responsibility of completing the food safety analysis, which includes an assessment of the microbiological, physical, and chemical safety of the product. The formulation, processing, distribution, and recommended end use are evaluated for any possible contribution to an unsafe product situation.**

2. Product Specifications.—There must be a product specification for each product sold or otherwise distributed. The specification must take into full account all safety, quality, and regulatory requirements and specify the use of all ingredients, process and acceptance tests, and packaging materials and labels, as well as a description of the process and of the finished

[3] Workshop, vol. I, p. 239.

[4] Carl A. Smith and James D. Smith, *Quality Assurance System Meets FDA Regulations,* paper presented at Symposium on Impact of FDA Regulations on Quality Assurance, November 1975.

[5] Ibid.

product. The product specification also serves as the vehicle by which Pillsbury's pure food policies and the FDA regulations and standards are communicated to the manufacturing operations.

3. **Physical Systems Hazard Control.—Each business is required to make and maintain an inventory of all food-processing systems and environments and the possible hazards to food safety that could be caused by them. Whereas the product safety analysis and the product specifications are R & D-originated, the physical systems hazard control system is a facility-generated set of documents which the facility must maintain. In order to identify all physical systems hazards, a clear understanding of each step in the processing and packaging of food is necessary. Since flow diagrams aid in defining the total process, and since physical systems hazards can be identified on them, we require each business to:**

   —Develop and maintain flow diagrams on all food processing and physical systems and environments.
   — Identify all physical systems hazards to product safety.
   — Establish and document systems of control for all hazards.
   —Maintain records of control actions for all physical systems hazards that are critical to product safety.

4. **Purchasing Requirements.-Our purchasing requirements dictate that all food ingredients and packaging materials may be purchased only from an approved supplier. An approved supplier is one who has submitted an acceptable continuing guarantee, submitted adequate proof of his ability to furnish products which meet our quality and safety requirements, and passed a plant inspection whenever required by Corporate Quality Assurance. A supplier may be removed from the list for unsatisfactory performance.**

5. **Contractor Requirements.—Any company product manufactured, packed, or supplied by a third party—i.e., contract manufacturers or packers—must be produced in accordance with an approved written contract and appropriate approved specifications and food safety analysis. All facilities to be used in manufacturing or packing of such products must be inspected by qualified personnel for Good Manufacturing Practices compliance and approved by Corporate Quality Assurance.**

6. **GMP Compliance.—Sanitation procedures for assuring Good Manufacturing Practices must be documented and religiously observed at each production, storage, and distribution facility, including the R & D Center. These procedures are "how-to" instructions for complying with sanitation procedures and do not go into the technical aspect of why these practices must be followed. The technical aspects are handled by in-plant training of the affected personnel.**

7. **Product Recall System.—A product traceability system must be in effect and capable of tracing all products or materials sold or distributed which may require recovery. Each of our businesses has documented procedures--some manual, some computerized—for the prompt tracing of products, and each of the plants must establish procedures for accomplishing a product trace. Periodic tests of the traceability systems are conducted and the results are documented.**

8. **Customer Service.—Means must exist to record and immediately respond to consumer and customer complaints as well as to correct any safety or regulatory deficiencies discovered in products as a result of such complaints. A product recall might be one result of an action undertaken because of such a complaint.**

9. **Inspections and Safety Incidents.—Each business must have a means to record and respond to all safety or regulatory incidents that occur. A regulatory incident is defined as a visit by a Federal, State, or local inspector or any regulatory agencies including the FDA, USDA, EPA, OSHA, FEA, military veterinary corps, State and local health inspectors, civil rights inspectors, etc. Our facilities are defined as many of our plants, mills, warehouse, restaurants, R & D centers, etc.**

10. **Auditing.—All processing plants, warehouses, and other storage facilities are routinely audited by Business Quality Assurance personnel to determine their degree of compliance with the business and corporate standards regarding specifications, product safety, and regulatory requirements.**

Date Coding by *Manufacturers:* **Food** manufacturers have dated products for years; however, dates and certain other manufacturer's information usually appear in some form of code. In establishing coding, the food industry was concerned primarily with providing a tool for inventory and quality control. Codes made it possible to trace product

movement, to identify and handle consumer complaints, to rotate stock, and to identify product loss in the event of a recall. As a result of today's increased consumer concern, the food industry is providing clearly identified information on freshness of product when purchased and, in some cases, anticipated home storage life. Figure 13 lists examples of date coding being used by manufacturers.

Private Labeling and National Brands: Information is conveyed on the quality of products sold under manufacturer's brands and products sold under retailer's or other distributor's brands—i.e., private label. Many manufacturers strive to establish strong consumer preferences for their brands and in some branches of the food industry incur substantial advertising and sales promotion costs for this purpose.

Brand names and private labels are an instrument of differentiation, and as such they become a vehicle of change. In merchandising a brand, a company wants to differentiate to make it stand out differently in consumer's perceptions from other brands. This has been very useful in our society because of rising incomes and changing needs of consumers on the one hand and technological changes that enable changing a product's characteristics on the other. Society benefits from product change through new products such as convenience foods.

What brand names and private label products have done over the years is to establish a perceived quality of a product. Thus there is a **function, in an informational sense, of a brand name. As Dr. Angelotti indicated:**

> **You know when you buy Green Giant green beans, your perception of that quality is consistent and you can expect your perception to be met the way you want it to be met each time you buy Green Giant green beans. The variation is minimized.**
>
> **When you start talking about grades, that is where the rub comes in. I buy Green Giant green beans because as I perceive quality, I want that in that product. I might not buy Green Giant's corn because it is not mushy enough for me. It is how I perceive it.**
>
> **If you start talking about grades, what are you going to do with that? The thing that brand**

Figure 13.

Types of Dates

Several types of open dates may be used on food items:

Pull Date–This is the last day the retail store may sell the item as fresh. The date is designed to allow you a reasonable amount of time to store and use the product at home even if it is purchased on the pull date. How long the product should be offered for sale and how much home storage time is allowed are determined by the processor, based on his knowledge of the product and its shelf life. When you see "Sell by Jan. 15" on a package it doesn't imply you shouldn't use the product after that date. The date represents the last day of fresh sale so you will have time to store and use it at home.

Quality Assurance or Freshness Date–This shows how long the processor thinks his product will be at peak quality. Some time after the "freshness date" (and there will always be a cushion of time allowed), the food will no longer be of optimum quality. This doesn't mean that it will be unacceptable or that you shouldn't use it; it does mean that the processor would like you to use the product while it is at its peak. The label on the item might say something like "Better if used by January 1974. "

Pack Date–This is the date of final packaging or processing. Although it is sometimes used, it may not be very helpful to shoppers who don't have the technical expertise to judge the shelf life of thousands of different items.

Expiration Date–This is the last day the item should be consumed. It is virtually never used because quality changes **occur slowly and it is simply not possible to say that an item will be acceptable one day and unacceptable the next.**

Of these **dates,** the "pull date" and the "quality assurance or freshness date" are in most widespread use.

When you see an unexplained date on a food package you might check with the store manager or write to the processor. But it is important to remember that the date is not a "throw away" date.

After you get the food home, a good general rule is to rotate food on your shelves in order of freshness. For peak quality, use the items before or within a reasonable time after the date shown on the package.

SOURCE U S Department **of** Agriculture Economic Research Service

names offer to the population in my view is just that, the selection for them to exercise their perceptions of quality. As they know when they buy this brand, it is consistent over time, and they will always get essentially the same product if they stick to that brand name.[6]

That is one reason why most companies do not use the established grades for their processed products. They have their own standards, and it is their perception of quality derived from consumer surveys that is used to set their own standards. Thus the brand name is doing something useful for the manufacturer and conveying information to the consumer.

Potential Function and Impact of Retail Grading

Grade Criteria: The present public programs, such as the wholesomeness and safety programs and standards of identity programs conducted by FDA, assure the public that the processed food they buy is safe for human consumption. The nutritional labeling program provides consumers with nutritional information. In addition the private sector, through quality control programs and date coding, provides additional assurance that the food consumers buy is safe and wholesome. Given this, the question to be addressed is what additional useful role might grades perform? Whatever role grades might play, most of the food grading workshop participants felt that grades should continue to differentiate sensory characteristics only and not combine with nutritional characteristics as additional grade criteria.

Many problems were raised on the feasibility of combining nutritional characteristics with sensory characteristics. Dr. Wedral stated that:

Sensory characteristics of a product are not related to nutrition. For example in canning peas, there are different grades reflecting different colors or various defects, but they may all have the same nutrition. With orange juice, some of the earlier products or crops of oranges may be higher in vitamin C; however, they have less appeal from a color or flavor standpoint. That is why earlier varieties are not preferred. The product may be the most nutritious, but has the most defects, or the most off color or be the least uniform. How can you say this is Grade A and this is Grade B?[7]

Other problems expressed were those involving the time factor. Most participants in the workshop agreed it is impossible to analyze the products coming into a canning plant for nutrient qualities. Dr. Wedral stated:

In nutritional labeling, companies have been permitted to establish nutrient data banks in order to support their claims. (In other words, the nutritional information on this year's package represents information collected over many years.)

If a grading system were adopted that incorporated nutritional characteristics (and data banks were utilized), the grade on the product would be reflective of previous years' grades. Thus, for example, canned tomatoes packed and labeled Grade B due to information in the data bank might in reality be Grade A.

Thus, if a grading system were adopted that incorporated nutritional characteristics, the grade on the product would be reflective of the last year's grade. For example, canned tomatoes from a plant are Grade B this year when this year's might really be Grade A.[8]

Voluntary or Mandatory: Grades carry information to the consumer, as do brand names and private labels. However, there is a school of thought that believes brand names are a vehicle for change and cause new processed products to evolve. Grades, on the other hand, have just the opposite effect. According to Professor Daniel I. Padberg, Department of Agricultural Economics, University of Illinois:

Brand names through differentiation in the marketplace have become a vehicle of change. Grades on the other hand have the opposite effect-one of stabilizing, one of identifying a level of characteristic, requiring it and thereby stabilizing.[9]

Further, Dr. Timothy Hammonds, Vice President for Research, Food Marketing Institute, indicated mandatory grades may limit consumer choice in the longer run:

Mandatory grading would be a way of choosing among those products that are in the market

[6]Workshop, vol. I, p. 96.

[7]Workshop, vol. I, pp. 69-70.
[8]Ibid., pp. 70-72.
[9]Workshop, vol. I, p. 79.

place when in fact it is going to reduce the variety of products in the marketplace. And I think 'that is an unexpected consumer result of it.'[10]

So, if society looks at the choice of whether or not to institute retail grades, an important implication of that choice is the product it wants to stabilize in terms of characteristics and the product it leaves open for evolution. When grading is instituted, an inevitable consequence would be **to** suppress differentiation or variability and evolution of product characteristics.

According to Professor Padberg:

I **am** assuming there **are** subsets of the food industry **where differentiation may become a social detriment. That is to say the canned peas are not that different today than they were 30 years ago. And we are now supporting several different labels with minimum differences.**

If we had grades, then what would happen? What I would suspect will happen is that Del Monte or Green Giant who are now spending money on marketing peas, which is a standardized product, would use their research and development capabilities in other areas that were more amendable to development.[11]

Thus the potential for grades as a consumer information vehicle is not a universal product; it is a very selective one. It makes more sense in some products and relatively less in others. Sorting them out may be difficult. It means selecting those products where the differentiation cost is currently greater than benefits of differentiation to consumers.

Uniform *Nomenclature:* Based upon workshop evidence, concern regarding uniform nomenclature was in two categories. One was simplicity in terminology. A second was whether terminology could be devised which does not imply rank. Each of these concerns will be discussed in the following paragraphs.

Optimum terminology would be both simple and meaningful to consumers. However, there appears to be a tradeoff between meaningfulness and simplicity in terminology. For example, the simplest system would merely be an A, B, C or 1, 2, 3 system; but that system would not be meaningful in terms of conveying grade criteria or standards to consumers. One would not know whether A, B, C reflected nutritional information or other characteristics such as size and flavor or defects. To this end, descriptive labeling or grades have been suggested in processed food products. This system would mean that peas might be graded and given a descriptive term such as "young, tender peas" or "mature peas." Descriptive terminology, however, is best suited to processed products rather than fresh, since the characteristics of those commodities in processed form are less available to the consumer at the point of purchase than in the case of fresh. Terms that might be used for a particular fresh product grade may already be apparent.

Another difficulty is that all nomenclature implies rank, with the possible exception of a designation such as circle, triangle, square. The latter terminology represents an effort not to imply rank in the grade. Objection to implied rank is that second or third grade may in fact be superior for some end uses, or at some particular relative price, to the top grade. However, the circle, triangle, and square terminology would not imply grade criteria or standards.

Regardless of the terminology, the likelihood of most retailers offering all qualities or grades of a particular commodity is slight. Mr. Kimbrell expressed the feeling of most workshop participants when he stated that:

Any grading system, of course, is only as good as the selection it offers the consumer-that is, a retail grading system. And without some kind of a system that will be used that will offer a selection, then the effects of that grading system are going to be lost,

The people that are going to use it have to be getting something from it such as the retailers themselves. And in order to set up some kind of an advertising program, some kind of a system to incorporate a grading nomenclature therein, you are going to have to remove some of the stigma of the lower grades.

In this case, B is derogatory or C is derogatory, 3 is derogatory, 2 is derogatory. So you need some kind of a system.

[10] Ibid., p. 232.
[11] Ibid., pp. 172-173.

I am talking about the practical aspects of getting a system accepted by all parties and not just the consumers. And you are going to have to offer something to those people that are going to make use of it. And I think that they are going to have to get some kind of advantage.

In order to do this and for them to get away from strictly an A system, nobody is going to advertise that they sell B anything. They are not going to set up a system that will advertise a B or 2.[12]

In summary, the question of what terminology to choose is an unsettled issue. Even though optimum terminology is unsettled, strong support for uniform terminology was evidenced.

Summary

The potential role of retail grades for processed food products can only be defined in light of the current Government and private sector programs and their respective functions. Currently, Government programs regulate food products for wholesomeness and safety, provide standards of identity, fair labeling and packaging, nutritional information, and a grading system designed primarily for wholesale transactions. Most manufacturers have elaborate quality control programs that assure compliance with Government regulations and have insituted a voluntary date coding to ensure product freshness for consumers.

Terminology of current grades for retail processed products is confusing. For grades to be used more extensively at retail, uniform terminology across grades that is simple to understand is a basic need.

National brand names and private labels have substituted for grades at retail. They have established a perceived quality of a product for the consumer through time. Brand names and private labels have allowed society to exercise its perception of that quality by selection of one brand name over another. That is one reason most companies do not use established grade standards for their processed products. They have their own grade standards which are more detailed than current Federal grade standards.

[12]Workshop, vol. V, pp. 45-46.

The consensus of workshop participants was that whatever role retail grades play in processed foods, possible grade criteria should not include differentiating products based on a combination of sensory and nutritional characteristics. It is impossible to establish a meaningful grade when incorporating nutritional characteristics with sensory characteristics. Problems include an inverse relationship between sensory characteristics and nutritional characteristics for some food products. Such a relationship would mean that a grade would reflect an average value between sensory characteristics and nutrition and therefore not adequately reflect either. Also a problem is the time lag between establishing the nutritional content and labeling the product. Consensus of workshop participants was that nutritional labeling is the most appropriate vehicle for conveying information to the consumer.

Establishing retail grades for processed products would likely have a stabilizing effect on product characteristics. There would be less evolution of new products. Thus, if society looks at the choice of whether or not to institute retail grades, an important implication of that choice is what products should be stabilized in terms of characteristics and what products should continue to evolve. This means sorting out those products where currently the differentiation cost is greater than benefits to society of differentiation.

Congressional Options

Some of the options available to Congress for grading processed or manufactured food products include:

- Congress could standardize nomenclature for the first, second, third, and fourth grades for processed products so they would be consistent from one product to another.
- Congress could direct the Food and Drug Administration to disseminate information to consumers concerning the current programs that are in operation which assure the safety, wholesomeness, labeling, and identity of most manufactured or processed food products.

- Congress could support or provide incentives for educational programs by Government agencies or the private sector which inform consumers about nutrition of processed food products and interpretation and use of the current nutritional labeling program and/or grades for processed food products.
- Congress could make designation of the current processed grades mandatory for selected food products. Such a program should not be instituted, however, prior to standardizing nomenclature for the first, second, third, and fourth grades.

Fresh Fruits and Vegetables Sector

Present Status of Government Programs

As reviewed earlier in this document, grading programs of fresh fruits and vegetables are under the auspices of the Agricultural Marketing Service (AMS), U.S. Department of Agriculture. Current grades have evolved over a number of years. Specific fruit and vegetable product grades were developed primarily at the request of the various food industries involved.

Grades for fresh fruits and vegetables are based primarily on sensory criteria typically involving color, uniformity, exterior blemishes (in some cases), size, texture, and maturity. As previously reviewed, the criteria currently used for fresh fruits and vegetables are designed to facilitate wholesale rather than retail exchange. These grades essentially serve the purpose of facilitating wholesale exchange without necessitating onsite inspection.

Few commodities in the fruit and vegetable category carry their grade, if graded, all the way through to the retail shelf. Thus, little information is provided by the current grading system as to sensory characteristics, nutritional aspects, or wholesomeness and safety of the produce on the shelf.

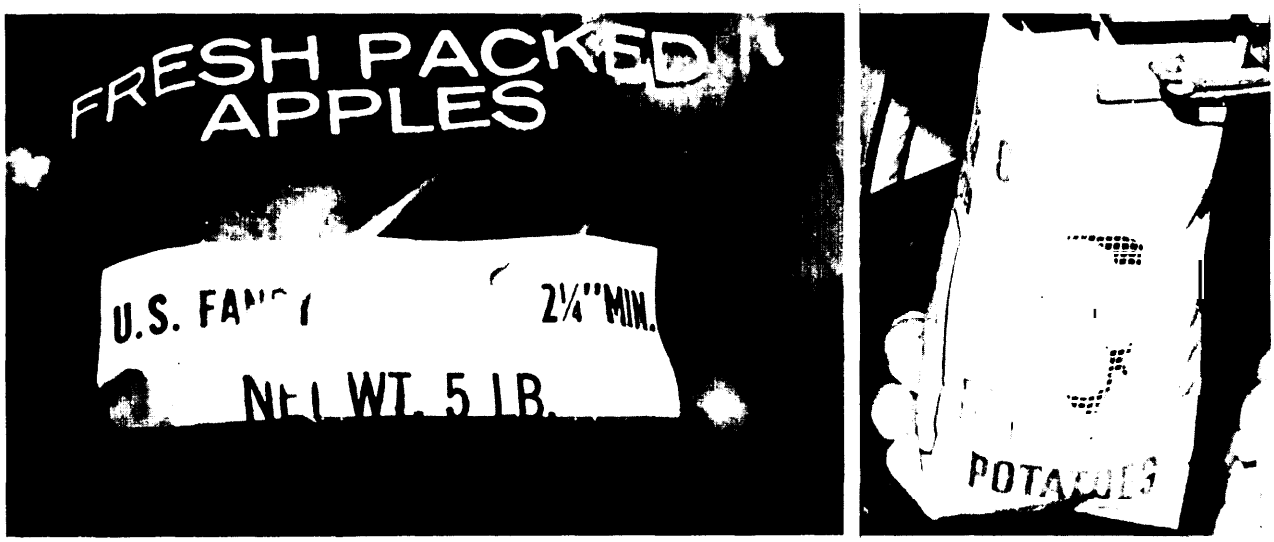
The function of grades in processed products is conceptually different from the function of grades in fresh products. The information role for grades in processed products may revolve around ingredient or identity standards because sensory quality of processed products is not obvious when that product is in a container. For example, attributes of peaches in a can are more difficult to determine prior to purchase than a fresh peach. Some argue that fresh produce is either obviously good or poor and that the grading system therefore need not deliver information, prior to purchase, concerning product sensory quality. On the other hand, some argue that the role of the grading system in the case of fresh produce is delivery of information concerning flavor and nutritive content. Both of these latter pieces of information would, presumably, aid consumers prior to purchase.

The Current Standards of Identity Program administered by the Food and Drug Administration substantially lessens the need for information concerning wholesomeness, safety, and sensory characteristics of processed products to be conveyed through retail grades. Commodities may be modified rather dramatically when processed. A strong need for consumer information concerning wholesomeness, safety, and sensory characteristics of these commodities in their processed state has been recognized through FDA programs. Contrast this with fresh produce, which basically is not altered from its natural state. In the latter circumstance, information concerning certain quality attributes is available through observation at point of purchase. Some argue this lessens the need for any Federal Government involvement in fresh fruits and vegetables.

Few fresh fruit and vegetable commodities are branded, or carry a brand name designation. This is especially true of produce sold in bulk at retail. There is a trend, however, toward fewer bulk retail sales and more packaged sales—i.e., bags, boxes, or other containers (figure 14). With packaging, brand names become more prevalent. So if the trend toward more packaged retail containers continues, brand names may become more prevalent for fresh products. Currently, though, the information role of brand names is not as strong in fresh produce compared to processed foods.

With respect to pesticides and other chemicals on fruits and vegetables, the Environmen-

Figure 14.
Examples of Fresh Fruit and Vegetable Packaging



USDA Photos

tal Protection Agency establishes a safe tolerance level for pesticides, which FDA enforces.[13] Because potentially harmful pesticide residues are already controlled through these Federal agencies, it is not a potential function for a grading system for fruits and vegetables.

Potential Function and Impact of Retail Grading

Grade Criteria--Nutritional Base: Consumer groups, as previously discussed, would like to see grading criteria changed to reflect nutrition of the commodity rather than merely physical appearance. Consumer representatives want Federal grades to include nutritional quality in addition to the already defined sensory characteristics such as appearance or size.

This does not seem to be possible in fresh fruits and vegetables, based upon workshop evidence. Within a particular fresh commodity such as lettuce, nutrition does not **serve as a useful basis for discriminating or sorting one head of lettuce from another because the commodities tend to be basically the same in nutritive content. There may be** significant differences between, for example, lettuce and carrots in terms of nutritive content; but a grading system can serve to differentiate only within a commodity category rather than across commodities. Nutritional information on fresh produce may be useful on an intercommodity basis and be meaningful to consumers, but not useful on an intracommodity basis. Nutritional information simply will not serve as a base for sorting within a commodity because nutrition is essentially invariant within a commodity.

Along these same lines, Mr. Eddie Kimbrell, Assistant to Administrator of USDA's Agricultural Marketing Service, stated:

> **Normally a grading system is something that separates commodities within a group. For example, within apples, there would be a set of apples that are different than another set of apples. And grading in this sense would separate those two categories within the same commodity.[14]**

However, there does seem to be a desire on the part of the industry to have a program comparable to the nutritional labeling of processed products. Professor Thomas Clevenger, Department of Agricultural Economics of

[13]Workshop, vol. I, p. 165.

[14]Workshop, VO1. I, p. 57.

New Mexico State University, indicated that:

> **There is a desire by the (fruit and vegetable) industry to have nutritional labeling in that the nutritional labeling at this point in time would probably be on a commodity-only basis. That is, there would not be different nutritional labels for say, a Grade A if we had one versus a Grade B or a Grade C. And that the implementation of that might have to be in terms of some posting of nutritional labeling regarding that commodity at the point of purchase as opposed to, say, placing a nutritional label on every banana.**[15]

As further clarification of nutrition serving as a base for grading, Dr. Angelotti pointed out :

> **As a rule, on a weight-for-weight basis there is no significant difference in nutritional quality of raw agricultural commodities.**[16]

Even if it were possible, a potential problem of a grading system at retail based upon nutrition is indicated by Dr. Wedral:

> **Would the consumer think a peach that is Grade A would supply the same amount of nutrients as a green bean that is Grade A? I think it (nutrition basis for grades) would create a tremendous amount of confusional T**

Dr. Wedral continued by indicating difficulties concerning laboratory techniques used to analyze particular nutrient values. She said:

> **Variability in laboratory techniques used in determining nutrient content can alone account for differences in label claims. In one collaborative study involving several laboratories, the average vitamin A content of samples of tomato juice taken from the same lot was determined to be 20,9 percent RDA with a standard deviation of 6.3 percent RDA. This means that depending upon the lab that ran the analyses, someone could claim as little as 15 percent or as high as 25 percent RDA for vitamin A. And really both claims would be based on tests on the same tomato juice.**[18]

The significance is that fresh produce would be subject to the same variability in laboratory technique if graded based upon nutrition content.

Other Bases: For fresh fruits and vegetables two potential information needs arise for consumers. One is information prior to purchase concerning yield per pound or the amount of edible product. A second potential information need is with respect to variety.

One possible basis for reflecting grade at retail is a per-serving basis on commodities such as lettuce, oranges, grapefruit, bananas, peaches, avocados, cantaloupes, and watermelons. These commodities have in common values which vary from one another on a cost-per-ounce serving basis. However appealing such a basis may be for a grading system, problems that are practically insurmountable would be experienced in implementation. One difficulty would be in the technology and testing necessary to determine the amount of edible product per unit of each and every individual commodity. A second factor is that subjective judgment can be constantly exercised during the purchase decision concerning product value (on a per-serving basis). For example, consumers can and do make subjective judgments concerning the value of particular produce from a bulk display at retail. Hence, a retail grade based upon yield (edible servings per unit such as pound, head, or bunch) may be of marginal benefit to consumers in aiding purchase decisions.

A second possible criterion for grades on fresh fruits and vegetables would be labeling with respect to variety. The idea of variety labeling would be to convey information regarding such aspects as use or flavor of the product. For example, in strawberries or apples the variety would convey to an informed consumer some characteristics concerning flavor and, in the case of apples, appropriate end use for that commodity. However, the variety labeling idea for conveying information at retail is limited. There are a number of commodities for which knowing variety may not assist in a purchase decision. In addition, an adequate job is probably being done in-store at point of purchase regarding the variety of product. As an example of this, apples are commonly labeled according to their variety at the point of purchase. Thus, the

---

Sworkshop, VO1. V, p. 30.

[16] Workshop, Vol. 1, p. 58.

[17] Ibid., p. 73.

[18] E.R. Elkins, "Interlaboratory Variability in Nutrient Analyses: Two Cooperative Studies," *Journal of the AOAC,* Vol. *57, No. 5, 1974, p. 1193.*

variety labeling concept has limited usefulness.

Voluntary or Mandatory Systems: The question of voluntary or mandatory grades on any commodity basically revolves around expected use at retail. Net benefit to consumers from voluntary programs would, of course, vary greatly depending upon the extent of use that was assumed for a voluntary system.

There seems to be a significant difference between the expected adoption of voluntary or voluntary/mandatory grades compared to a voluntary/mandatory program such as nutritional labeling. Voluntary grades may not be expected to be used the same way as nutritional labeling, indicated Professor Padberg:

> One thing would be markedly different in grading consumer products from the nutritional labeling experience is that, if voluntary, it (voluntary grades) would not be taken up at all. A very minor take, That is very different than nutritional labeling. Nutritional labeling gave large processors a great stake in consumer reaction, a vehicle that was perceived in our research and their research as being useful.
>
> It is also extremely flexible. It doesn't categorically restrict what they can do. They just have to tell about it. And so in their process of differentiation, that enables them (processors) to give Government legitimatized information about their differentiating activities. So it has been a very functional part of their marketing activities, where grades are quite counter to that. I think grades, although discussed as a vehicle or choice, would be restrictive on items in the market.
>
> Can you imagine being a produce buyer for a large chain trying to stock stores with two or three grades of cantalope? There would be a preferred grade in everything and the producer or grower is going to learn how to meet that preferred grade.
>
> So voluntary grades have different meaning than voluntary nutritional labeling and I think voluntary grading systems for consumer products is no system at all.
>
> Maybe that is all right, but I think in terms of implementation, 1 would get a very different take on the part of the large firms as compared to nutritional labels.[19]

In essence, the expectation would be that voluntary or voluntary/mandatory grading systems for fruits and vegetables carried to the retail level would not be adopted to the same extent that nutritional labeling has been adopted on a voluntary/mandatory basis for processed foods,

There are three basic systems under the voluntary/mandatory issue. One is a completely private voluntary system. A second is a combination voluntary/mandatory system, with a third being a completely mandatory system. With a completely private system, the standards and the adoption of those standards is done on a private basis and voluntarily. Under the voluntary/mandatory system, a Government standard is established, and then anyone who grades produce would be required to adopt the system. However, grading, for any particular firm, would be on a voluntary basis. The mandatory system would establish Government standards, and all produce would be required to be graded. From a consumer information viewpoint, the only serious systems would be the last two—that is, either a voluntary/mandatory or a mandatory system. The completely voluntary and private system would be of little use in providing consumer information with respect to purchase decisions.

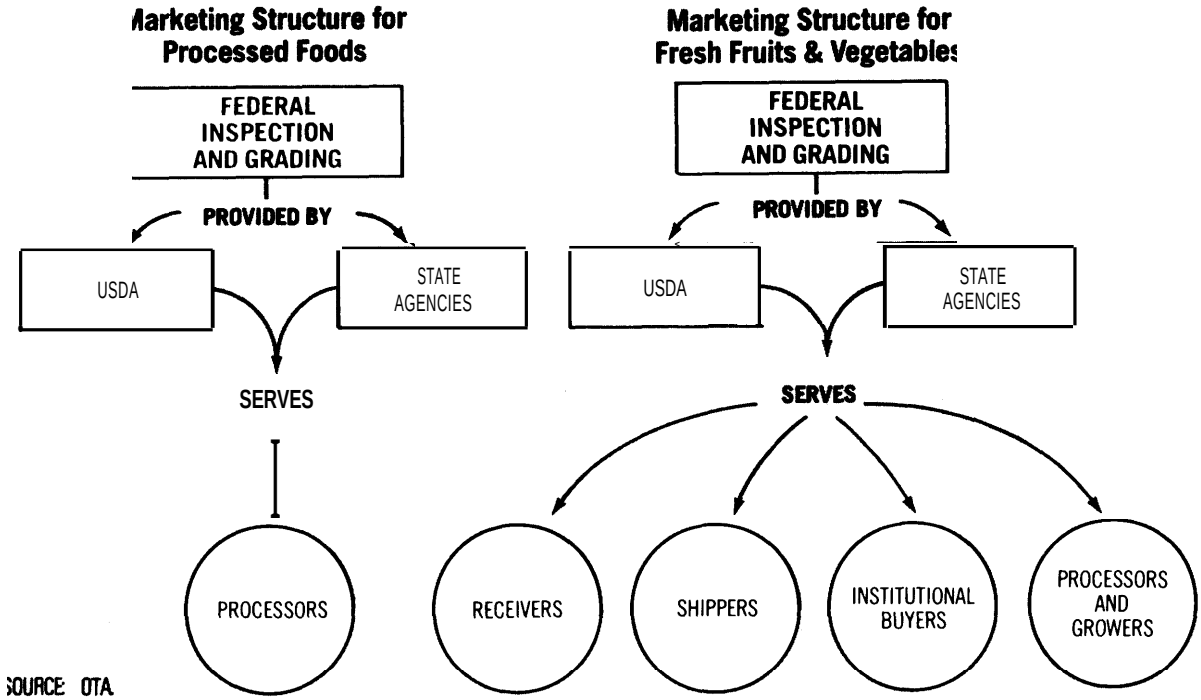
There are some general cost considerations relevant to a mandatory grading system. The structure of the marketing channel in fresh fruits and vegetables (see figure 15) is significantly different from the marketing channel for processed food products. In the latter marketing channel, there are points of concentration, particularly at the processor level. There are no similar points of concentration in the fresh fruit and vegetable marketing channel. The impact of this structural difference in the marketing channel from production to consumption is that no convenient place exists in the fresh fruit and vegetable channel to intercept a large proportion of the commodity so that it can be economically graded. As Mr. Kimbrell indicated:

> Unless there is an assembly point in the marketing channel, then grading by a third party may really be a problem.[20]

[19] Workshop, Vol. 1, pp. 230-231.

[20] Workshop, Vol. III, p. 3.

Figure 15.



However, there are alternatives to the third party method of grading, as Professor Clevenger indicated:

> The options might be to consider the possibility of not grading by a third party, but a third party acting only as a referee.[21]

Further elaboration of this option was given by Mr. Kimbell:

> There is one of the options that we have had wherein there may be more of a quality control kind of system on the part of industry with the industry doing the sorting and grading itself under the same kind of standard and supervision applied by other parties, State government agency or Federal Government agency, or someone who has no financial interest in the product.[22]

This system is commonly referred to as a voluntary/mandatory system wherein there are standards established by a third party. A third party does the monitoring of the system to be sure that misrepresentation is not permitted, but the industry does the grading on a voluntary basis. This contrasts to the mandatory system wherein a third party does all the grading using Federal standards and all produce is graded.

Because of this structural distinction between fresh produce marketing channels and processed marketing channels, there is a serious question as to the applicability of any grading system to all fresh produce. Professor Padberg elucidates:

> Now the problem with the grading system is that it favors a centralized commercial operation. To get Federal grading on produce moving through small local markets would be very expensive.
>
> We have a high price set on human labor, and we have adjusted our whole system to that. It favors durable and commercially grown produce. While there is local stuff that has quality anybody would recognize, a grading system just

[21] Ibid., p. 4.
[22] 1bid., p. 4.

doesn't fit it. That is a sad fact. But grading is not going to change that, I don't think.[23]

Thus, the structure of the industry is directly related to its geographic dispersion and the lack of concentrated points through which the product flows. A strictly mandatory system of grades would be extremely expensive due to this dispersion.

In terms of use of grades on a voluntary basis, incentives for grading by industry were not clear. Professor Clevenger addressed this issue in general:

> What incentives would be there if grading were voluntary? Grades would really have to convey some specific types of information that are not now communicated to differentiate products if it (grading system) were to be implemented on a voluntary basis.
>
> And I don't think that we are positive that in fact we could devise a grading system that would do that in the case of fresh fruits and vegetables.[24]

At **a different point** in the workshop proceedings, Professor Clevenger continues on the same topic but with specific reference to fresh fruits and vegetables:

> It seems to me there is an excellent option for getting to be voluntary and for industry to use it as a competitive device just as we have in nutrition labeling. The same argument we applied to nutrition labeling we could once again apply here.[25]

The cost of a system is sometimes felt by consumer representatives to be an excuse for certain courses of action. As Ms. Cross indicated:

> I can't quite go to the actual cost because I know if industry doesn't want to do it, they will talk about the cost, and if they do want to do it as a voluntary nutritional labeling program, they are not complaining about the cost.[26]

However, the analogy between the cost incurred in nutritional labeling versus the cost in grading fresh fruit and vegetables does not seem to hold. As Dr. Thomas Sporleder, agricultural economist from Texas A&M University, indicated:

> There is a tremendous difference, though, in the cost, it seems to me. In nutritional labeling there is a big start-up cost, and after the system becomes operational on a permanent basis it is not very much.
>
> When you are talking about grading fresh fruits and vegetables, it is a continuous cost. There is no start-up and then dribbling out (of costs) afterwards. It is just constant, continuing.
>
> **And so there is a tremendous difference** in the costs we are talking about. It would be more expensive to grade fresh fruits and vegetables than it is to institute nutritional labeling on canned products.[27]

Uniform Nomenclature: As previously discussed in this report, consumer advocates want uniform nomenclature for various grades which might cover all commodities graded under Federal standards. With respect to fresh fruits and vegetables, existing regulations could be changed to make grade terminology uniform and easier for consumers and industry to understand. This could assist consumers' use of the current grading system.

The structure for the terminology makes U.S. Fancy, U.S. No. 1, U.S. No. 2, and U.S. No. 3 the four designated terms applying uniformly to fresh fruits and vegetables that are graded. With the new simplified terminology, the criteria on which an individual product is graded may remain unchanged. The program announced by the U.S. Department of Agriculture potentially will take several years before the new uniform nomenclature is adopted.

From the food grading workshop, no argument or disagreement prevailed concerning whether or not there was a need for uniform nomenclature. There was overwhelming agreement that uniform nomenclature would be desirable from consumers' viewpoint and would not be contrary to the interest of industry, However, there was disagreement on what the uniform nomenclature should be, Concerns about the aspects of uniform nomenclature have at least two dimensions. One is the need for simplicity in any uniform nomenclature scheme. **A** second concern is implication of rank that comes from most

[23] Workshop, Vol. V, p. 39.
[24] Workshop, Vol. III, p.35
[25] Ibid., p. 63.
[26] Ibid., p. 66.
[27] Workshop, Vol. III, pp. 66-67.

uniform nomenclature system, which has interesting potential consequences on industry merchandising practices.

There is no reason that uniform nomenclature should not be implemented for fresh fruits and vegetables. Consensus was that uniform nomenclature could be relatively easily instituted and would be relatively low cost compared to other possible changes in the current Agricultural Marketing Service grade standards. As previously mentioned, the U.S. Department of Agriculture has announced a uniform nomenclature program for fresh fruits and vegetables. However, implementation of this uniform terminology may take several years.

Fresh fruits and vegetables and processed product sectors are similar with respect to the uniform nomenclature issue. In both sectors, workshop participants expressed concern both about tradeoff between simplicity and meaningfulness in terminology and that all nomenclature implies rank. More detailed discussion of these issues appeared previously in the Processed Products section of this chapter. In regard to fresh fruits and vegetables, the question of what terminology to choose is an unsettled issue, However, participants voiced strong support for uniform terminology for fresh fruit and vegetable grades regardless of the terminology chosen.

Summary

In terms of consumer information considerations, uniform terminology across grades that is simple to understand is the most basic need. Although some question exists concerning optimum terminology for any uniform nomenclature, no reasons seem to exist for not instituting uniform nomenclature across fruit and vegetable commodities regardless of the standard terminology chosen.

A second area of consumer information concern is nutrition. Nutritional information apparently cannot be combined with grade criteria or serve as the basis for grading, since nutritional content is similar within any particular product. This means that nutritional information cannot serve as a base for sorting among various products within a category, such as heads of lettuce. Nutritional information could be provided among categories of products—that is, lettuce versus carrots—by placing average nutritional information for each type of produce at the point of purchase in retail stores.

Other potential bases for grades do exist for fresh fruit and vegetables. One possible basis discussed by workshop participants was a grading system that reflects a per-serving basis, A second possible basis discussed was standard labeling with respect to variety. Although some may not consider such bases as a grading system per se, such systems potentially would provide additional consumer information and thus serve the same function as retail grades or be a substitute for retail grades. However, both the variety labeling concept and the yield-per-serving concept were judged by most workshop participants to have limited usefulness for fresh fruits and vegetables.

In terms of the three systems for implementing grading system—namely, voluntary, voluntary/mandatory, and mandatory--only the voluntary/mandatory system seems to be appropriate for fresh fruits and vegetables. Evidence exists that a voluntary system would be no system at all, On the other hand, a mandatory system would not likely produce a positive net benefit to consumers, since costs would be substantial in a mandatory system, while the information provided would be of marginal benefit to most consumer purchase decisions.

Congressional Options

The following are some of the options available to Congress for grading fresh fruit and vegetable products:

- Congress could direct USDA to immediately adopt the new simplified grade terminology for fresh fruits and vegetables as announced by USDA in July 1976. This would mean that program adoption would not remain at the initiative of growers or processors of these commodities.
- Congress could support or provide incentives for educational programs by

Government agencies or the private sector which inform consumers about nutrition of fresh fruit and vegetable products and the differences in nutritive content from one commodity to another.

- Congress could direct USDA to administer a standard labeling and variety identification program for fresh fruits and vegetables which are sold in retail packages.
- Congress could direct USDA to facilitate adoption of a voluntary/mandatory nutritional labeling program for fresh fruits and vegetables.
- Congress could make the current wholesale grade designation mandatory at retail for fruits and vegetables that are currently graded.
- Congress could make grading mandatory for all fresh fruits and vegetables using the current wholesale grading criteria and designate such grades at retail.

Fresh Red Meat Sector

Fresh red meat refers primarily to beef. This is because beef accounts for the largest proportion of consumer expenditures on meat. In 1976 it accounted for 54 percent of the $46.1 billion consumers spent on all meat. Poultry is excluded from this decision because: 1) in relation to beef it accounts for a small proportion of consumer expenditures on meat (12.5 percent in 1976); and 2) the present carcass grading system for poultry is suitable for consumer purchase decisions since most poultry is sold by carcass at retail. [28]

Present Status of Government Programs

There are two Government programs which influence meat grades at retail. The best known system which currently exists for red meat is a carcass-grading system sponsored by the U.S. Department of Agriculture and reviewed earlier in this document. This system is not a retail grading system, but again is oriented to facilitating wholesale exchange of meat products. The current grades are carcass grades and not retail cut grades.

A second major Government program is a combination of Federal and State inspection of meat carcasses. This inspection essentially assures safety in the food product. The inspection system is mandatory for meat. Thus, all red meat in commercial channels sold through retail outlets is inspected under this program.

The extent of use in the US. Department of Agriculture grading system is widespread but not total. About 50 percent of the commercial cattle slaughtered were federally graded in 1975 (see figure 16). Of this total that was federally graded, 5.1 percent was Prime, 77.3 percent was Choice, 12.9 percent was Good, 0.7 percent was Standard, 0.4 percent was Commercial, 3.1 percent was Utility, and 0.5 percent was Cutter-and the Canner grade was insignificant.[29]

Two concerns emerge for consumers in terms of the present Government programs relating to grading of meat. One is that the grading system is not used for all beef and, secondly, the grading system is still oriented toward wholesale exchange and therefore not carried to retail shelf in a manner that optimally assists consumer purchase decisions.

Present Status of Private Sector Programs

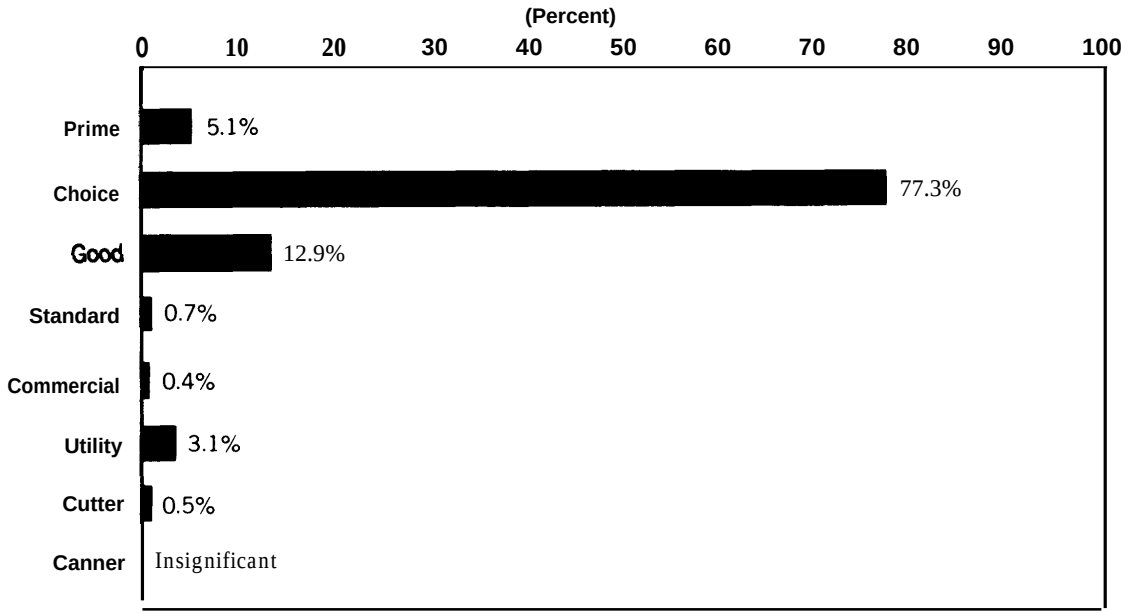
An active trade association in meat is the National Live Stock and Meat Board with headquarters in Chicago, Ill. In September 1973, the National Live Stock and Meat Board announced voluntary meat identification standards. An industrywide Cooperative Meat Identification Standards Committee developed fresh meat identification standards in an effort to eliminate confusion at the meat counter (see figure 17). This committee reduced 700 frequently used names to 314, of which about 150 were expected to be used by the average retailer, The project was coordinated by the National Live Stock and Meat Board in cooperation with the Food Marketing Institute National Association of Retail Grocers of the United States, and the National Association of Food Chains, as well as other interested

[28] USDA, *National Food Situation*, Economic Research Service (ERS), December 1976.

[29] Workshop, Vol. I, p. 251.

Figure 16.

Breakdown of Meat Grades of Federally Graded Commercial Cattle, 1975*



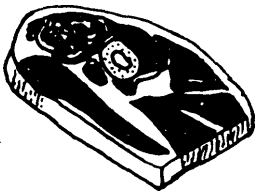
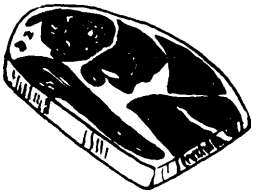
● MY about 50% of the cattle slaughtered in 1975 were federally graded.
SOURCE: Office of Technology Assessment.

groups representing various industry segments. Under the voluntary identification system, each fresh meat label at retail would indicate the name of the species—i.e., beef—the primal or wholesale cut from which the retail cut is derived—i.e., round-and a standardized retail name—i.e., round steak, This voluntary program is gaining widespread acceptance and has even been adopted as a law by some State legislatures. Basic to any retail-oriented grading system would be uniform identification of the retail cut. This voluntary program provides a basis for that uniform identification.

Another program of the private sector that potentially may evolve is a national educational and research program sponsored by beef producers. Enabling legislation to establish such a national program through funds provided by producers has passed Congress and has been approved by the President. Some **time early in 1977, a referendum will be held among beef producers to either approve or disapprove the financing of such a program through contribution of beef producers on a volume basis. If the program is approved, educational material and services could be initiated through this national program which would provide nutritional information, and other consumer-oriented information** (such as cooking and preparation ideas for particular end uses).

There are some brand names at retail for fresh meat. The informational role of these brand names would be consistency in quality over time. That is, they would assist consumers in the sense that the same brand name would be of comparable quality from one purchase to the next. However, these brand names would not assist a consumer in making a decision among brand names at a particular

Figure 17.– Selected Examples of Voluntary Meat Identification Standards

Commonly Used Name(s) and Other Information	Illustration	Recommended Name and Cooking Method(s)
Arm Chuck Steak Arm Steak Beef Chuck Arm Swiss Steak Chuck Stk. for Swissing Round Bone Steak Round Bone Swiss Stk.	a 	**BEEF CHUCK ARM STEAK (Braise)**
Boneless Arm Steak Boneless Round Bone Stk. Boneless Swiss Steak	a 	**BEEF CHUCK ARM STEAK BNLS** (Braise)
Barbecue Ribs Braising Ribs English Short Ribs Extra Lean Fancy Ribs Short Ribs	b c 	**BEEF CHUCK SHORT RIBS** (Braise, Cook in Liquid)
English Steak Shoulder Steak Shoulder Steak, Bnls. Shoulder Steak, Half Cut	d 	**BEEF CHUCK SHOULDER STEAK BNLS** (Braise)

SOURCE National Live Stock and Meat Board

time. Few brand names exist for fresh meat as compared with those for processed products.

Potential Function of Retail Grading

Grade Criteria: A common dilemma among all three commodity categories considered in this report is that current grading is not indicative of value differences to the consumer. Meat grading is done on wholesale cuts but not retail cuts, although sometimes the retail package carries the grade designation of the carcass from which it was cut. For grades to be meaningful, grade distinctions should be made in terms of value differences.[30] In an effort to make meat grades deal only with the fabrication of retail cuts, Professor Padberg argues:

> The concept of retail meat grades should have two criteria: parent material, one; and two, what happens in the fabrication of retail cuts, the trim, yield question,
>
> When you get down to parent material, there is little problem in that, one, the parent material is not a very good predictor of consumer values in the first place. The amount of consumer value you get from going up the grades in parent material is small. And, two, there are a lot of innovative opportunities for changing the parent materials.[31]

Professor Padberg continues:

> What Prime, Choice, and Good have told the consumer is something pertaining not to their market but somebody else, And if you are going to have grade to deal with their values, it would be less confusing instead of more to have a new set of names because you are talking about a different set of values and a different set of tranformations.[32]

Another concern specifically related to meat is the relationship between nutrition and the current wholesale grading system. Concern about fat content, both in terms of trim and intramuscular, have led some to question whether or not grades in meat could be based on nutritional content. Workshop evidence on that point indicates overwhelmingly that nutrition would not serve as a useful basis for grades when combined with palatability considerations. Professor Zane Palmer addressed this issue:

> Marbling is almost always positive in its relationship to palatability but is not the indicator of tenderness, juiciness, and flavor that we once thought it was.[33]

Professor Palmer continues along a similar line:

> Nutritional superiority and palatability do not necessarily have to go hand in hand; they can sometimes go in opposite directions. So how can you average out the two extremes and come out and say it is average in nutrition and average in palatability when that represents neither extreme value? And for this reason I think you are averaging apples, doughnuts, and coming out with oranges, and it is just not valid to do that.[34]

Mr. Kimbrell agreed, saying:

> It would be much better to have both the grade and fat designation if you want nutritional labeling, but you would confuse the issue if you combined them into one designation.[35]

Thus the workshop consensus was that nutritional labeling may be a desirable program for retail cuts of meat but that it should not be combined with or in any way considered as a grade criteria. The primary reason for this is the confusion which would result from such combinations.

Another consideration in attempting to make nutritional content the basis for grade was indicated by Professor Padberg:

> Another thing that has been a very great difficulty in labeling problems is the basic topic of nutrition itself. We have a conception of nutrition that deals with diet. Now to go from a diet to a food product is a very basic difficulty.
>
> We can conceive of nutritious diet, but the concept of a nutritious food product has not ever been developed. There are many components of a nutritious diet and the concept of getting them all in a product is very repulsive to nutritionists, and I think the populace in general. So here is a very great difficulty in nutrition labeling. Any product is a component of a diet, and it maybe a useful component although it is very lopsided in its individual characteristics. What makes a nutritious product is what other products it is

[30] **Workshop**, Vol. IV, p. 35.
[31] **Workshop**, Vol. IV, pp. 64–65.
[32] **Ibid.**, p. 72.
[33] **Ibid.**, p. 5.
[34] **Ibid.**, pp. 2-3.
[35] **Workshop**, Vol. 1, p. 151.

combined with in a day or a period of several days. We have a conception of nutritional diet; we do not have a conception of nutritional product.[36]

Dr. Angelotti summarized this point by saying:

We ought to be thinking about nutrition information and nutrition labeling as something different from grading. We want it, people should have it, they should learn to use nutritional labels, and that should be an independent consideration at this point in time from grading.[37]

When nutrition is considered in terms of vitamin and mineral content of food, the above discussion applies. That is, if nutrition is conceived as the content of a particular product in terms of vitamins and minerals, then workshop consensus was that such information would best be supplied on a separate label on a fresh meat package. There is concern by some that the percent of fat to total weight on fresh meat may be nutritionally significant from a health standpoint. Along these lines, workshop participants discussed two possible systems for retail grading of fresh meat. The systems are yield, either on a per-pound basis or per-serving basis, and uniform mandatory labeling. Each will be discussed in turn in the following paragraphs.

The potential system of yield per pound or per serving is conceived as dealing with trim (or the amount of external fat in relation to lean per retail cut) in grade standards. In addition, intramuscular fat or marbling may or may not be included as part of the grade criteria. Such a conceptual system may increase the relationship between grade values and nutritional values. An illustration of how such a conceptual system might work is given by Professor Padberg:

A grade standard might include two or three things. One might be that the first grade (a retail cut) might come from Prime carcasses and then it might have other criteria to deal with trim or internal fat as well.

Maybe grade two would come from a Choice carcass and perhaps have the same trim standards, but not the internal fat, so you would end up with some retail grade that deals with consideration of value to the consumer, of which trim is probably the most important.

What this would do would certainly give the market system a lot better information. Because you would have a price for Grade 1 and different price for Grade 2. Now, you have the scramble for the difference, and you do not know what economic values accrue to different trim. So in terms of making a market work better and marking products described better, in terms of functions of grade, I think this would identify the functions of a grade.[38]

It would be necessary to define retail cuts through some standard uniform system before such grading could be operational. This means that a system such as the current voluntary system of the National Live Stock and Meat Board[39] would need to be universally adopted before a yield-per-pound or per-serving grade would be feasible.

Another difficulty with such a system would be the logistic of implementation. Professor Palmer addressed this point:

Composition of a meat product is not determined until you finish the fat trim and know how much bone you are going to remove. So on fresh meats, it would be extremely difficult to develop meaningful information on composition, on say a steak, or a roast, or pork chop, or what have you.

And therefore it is so variable and the shelf life is only 72 hours after you cut it anyhow, which means that you have a deadline between the time that you set up exactly what the retail cut is until the time that it is sold, so most of it is sold before that time period. So as I see it in fresh meat, to have nutritional information on that specific cut can be virtually impossible. But, what you might want to do if you wanted to do anything would be to say what it (nutrition) is in general,

The best you could hope to do on an individual retail cut is to determine in general nutrition if on a fat constant basis or a fat and bone constant basis.[40]

This also illustrates the logistic difficulty of grading individual retail meat cuts. Shelf life

[36] Workshop, Vol. I, p. 136.
[37] Ibid., p. 143.
[38] Workshop Vol. IV, pp. 8–9.
[39] *Uniform Retail* Meat *Identity Standards*, National Live Stock and Meat Board Publication, Chicago, Ill. 1973.
[40] Workshop, Vol. I, p. 131.

on fresh retail cuts of meat is typically no more than 3 to 4 days. This is an extremely important physical characteristic of fresh meat compared to either processed products of fresh fruits and vegetables.

Other Bases for Grading: Another system is one involving uniform mandatory labeling of fresh meat at retail. Although some may not consider this to be a grading system per se, such a system would provide consumer information via labels and in that sense serve the same function as grades. This concept amounts to making a system mandatory at the Federal level such as the National Live Stock and Meat Board meat identification standards, Some suggest that the primary consumer information need with respect to fresh meats at retail is a standard identification of retail cuts over time and over geographically separate markets. The contention is that consumers can readily determine value of individual retail cuts by simply looking at the amount of external fat in relation to total weight. If this contention is accepted, then uniform mandatory labeling would provide unique and distinct information which consumers cannot otherwise determine.

An extension of this second system may or may not involve mandatory wholesale grade identification for individual retail cuts. As mentioned previously, with the current beef grading system, carcasses are graded but individual cuts are not. Of course, carcasses are the parent material from which retail cuts are derived (see figure 18). Mandatory display of the grade of a carcass from which a retail cut is derived could be part of a uniform mandatory labeling program. Such extension of the present wholesale grading system would provide more uniform consumer information with respect to grade than is currently available.

Potential Impact of Retail Grading

Costs for any fresh meat grading system applicable to retail cuts depend upon the distribution system which is assumed prior to calculating costs, Three distinct and separate distribution systems can be defined, One is the current distribution system using current technology. A second is centralized processing of fresh retail cuts, while a third is centralized processing of frozen retail cuts. Each of these systems is explained in turn.

Current technology is to fabricate retail cuts at the retail store level. This means that primals, subprimals, or carcasses are transported through the marketing channel from either packing plants or distribution centers to retail stores. In the meat workrooms of retail stores, individual retail cuts are cut and packaged. This distribution system is the one used for most distribution today.

Centralized processing of fresh meat cuts implies that the fabrication of individual retail cuts is not done at the retail store level but at a more centralized location such as retail chain distribution center or even a packing plant. However, because of the physical limits on shelf life of individual fresh retail cuts, there is a time limit on handling and transporting fresh cuts. If these cuts are fabricated at the distribution center or packing plant, shelf life may be a limiting factor on feasibility of the system. Shelf life on individual fresh retail cuts may be extended by rather sophisticated packaging techniques (such as vaccum packaging), but this is relatively expensive packaging compared to conventional packaging. Some experimentation has been done with centralized processing of fresh retail cuts, but due to the shelf life limitations mentioned, the system has not been widely adopted.

A third distribution system is centralized processing of frozen retail cuts. The obvious factor mitigated by freezing is shelf life. Freezing extends shelf life while preserving product quality, so that transportation and storage time are eliminated as a problem. Freezing is most useful for beef but may not be as advantageous for other red meats.

Current freezing technology for beef is to flash freeze individual retail cuts with either nitrogen or carbon dioxide. With this system, beef is cut centrally, frozen at the central location (either distribution center or processing plant), shipped in freezer vans, and sold in a frozen state at the retail case. This system potentially offers cost savings over the previous two systems described, even though it is relatively energy intensive. The system has

Figure 18

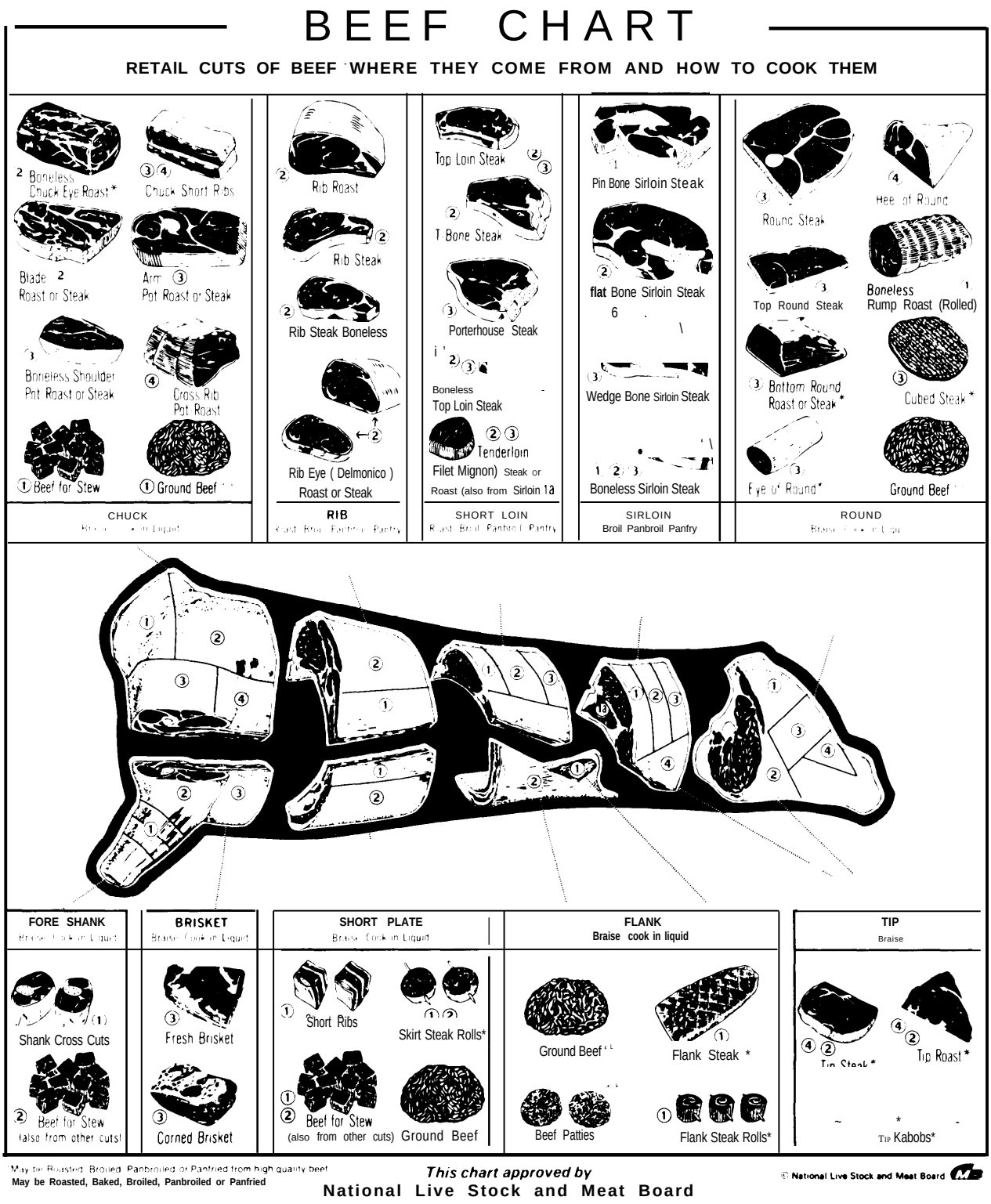


Photo: National Live Stock & Meat Board, Chicago, Ill.

been used on an experimental basis for beef and is currently being used by some processors and retailers, but the system has made no major inroads in the mass distribution of beef.

There is a direct relationship between the type of distribution system and the cost of any retail grading system. The cost of any mandatory retail grading system would be prohibitive under the current distribution system where retail cuts are fabricated at the retail store level. Professor Palmer elucidates:

> **Naturally, if you do it at each individual retail market, your cost of grading service is** going to be prohibitive. Right now you have one grader out in Iowa, for example, and I suppose that one grader would grade 800 or 1,000 carcasses a day. And if you go to a retail store, it would take one retail grader per store and he would be grading every few carcasses.[41]

This means that the cost of that grading service on a per-unit basis increases substantially when the grade is established at retail compared to a product concentration point, such as a packing plant. Any centralized distribution system would alleviate this burdensome cost at retail and be significantly less expensive than grading at the retail level without changing consumer benefit from the grading system.

Costs involved in actually grading products, via inspection costs, are sensitive to the above distribution systems. However, the enforcement aspect implied by voluntary or mandatory grading programs may not be as sensitive to the type of distribution system. The workshop provided no indication as to the magnitude of enforcement cost on any voluntary or mandatory system. However, this is a substantial cost consideration which would need extensive investigation before any particular system could be fully evaluated in terms of cost.

Technology in Relation to Tenderness in Beef

There are several ways to influence beef tenderness; some methods of tenderization are of long standing, others relatively new. Use of protelytic enzymes as a tenderizing process is patented by a proprietary meat packer, and fresh beef so processed is currently at retail under a brand name of the packer. The technique was developed several years ago.

A newer technology, currently being researched at several universities, is post-mortem but pre-rigor electrical stimulation of beef carcasses with, for example, 320 volts at 5 amps for 20 seconds. Although this technique is still in the experimental stages, results thus far indicate such treatment significantly tenderizes beef of several grades. Another technology for tenderization of beef is termed "mechanical tenderization." The process has increased in application during the past several years. This technology uses a machine with tiny blades or knives which significantly tenderizes the meat.

There is a relationship between such technologies and the function of retail grades. If significant new technologies are developed which tenderize meat on a rather uniform basis regardless of grade, then the necessity for grade being based on tenderness (and therefore maturity and marbling) would be significantly reduced. Similar technologies have already altered the functions of grades but future impact is not clear at this point.

Summary

The fresh meat industry currently uses the grade system best known to consumers, although it is basically a wholesale-oriented system. The system is voluntary/mandatory, and there is uniform grading terminology across fresh meat products. However, the current grading system is voluntary and not used for all meat. Nor is the carcass grade necessarily identified on an individual retail package.

One of the most significant needs for consumer information regarding fresh meat at retail is identification standards for retail beef cuts devised by the National Live Stock and Meat Board that provide standardized identification and labeling. This program has even been adopted as law in some States.

Concern about fat content, both in terms of trim and intramuscular, raises the question

[41] Workshop, Vol. IV, p. 30.

concerning retail meat grade criteria based on nutritional content, Workshop evidence indicates overwhelmingly that nutrition would not serve a useful basis for grades when combined with palatability or other sensory characteristics. The primary reason is that nutritional superiority and palatability are not necessarily positively correlated, Combining the two would result in confusion. Most workshop participants thought nutritional labeling separate from grade criteria was a more desirable program for retail cuts of meat.

A prerequisite to adoption of an individual retail cut grading system would be standardized fabrication, retail cut nomenclature, and labeling procedures. Given standard identification of retail cuts, a grading system based on yield of edible meat on a weight basis would be possible. Such a system would have both advantages and disadvantages, as discussed above.

Cost and net consumer benefit would depend significantly on the type of meat distribution system that existed. **In essence, the technical feasibility of reflecting the composition of meat—that is, fat, vitamins, and/or minerals—exists. Net consumer benefit, however, varies greatly by type of grading system and by type of distribution system. Further detailed analysis would be necessary to determine net consumer benefit for any combination of grade system and distribution system.**

Congressional Options

The following are some of the options available to Congress for grading fresh meat:

- Congress could make the current voluntary program on meat identification standards mandatory for all retail meat cuts. This would facilitate uniform identification of retail meat cuts.
- Congress could direct USDA to facilitate the adoption of a voluntary/mandatory nutritional labeling program for fresh retail meat cuts.
- Congress could direct USDA to institute a voluntary/mandatory program of retail meat grades where grade criteria are based on yield per pound or per serving, Such a program should not be instituted, however, prior to a program that would assure uniform identification of retail meat cuts.
- Since net benefit of any retail grade scheme is highly dependent upon the type of meat distribution system in existence, committees of Congress with jurisdictional authority could examine the potential for lowering the distribution costs of meat from various systems (such as conventional compared to centralized frozen) in oversight hearings. Such hearings could produce further evidence on the potential impacts and benefits of retail grade alternatives for meat.
- Congress could make grading mandatory for all fresh red meat using the current carcass grade criteria and designate such grade on all individual retail meat cuts.