Strategic Roles of Food and Agricultural Standards for Agrifood Industries

Thomas Reardon

(contact person, reardon@pilot.msu.edu) Michigan State University and FAO Regional Office for Latin America and the Caribbean

Jean-Marie Codron (paper presenter) Institut National de Recherche Agronomique, Montpellier, France

Lawrence Busch, James Bingen, Craig Harris

Michigan State University

Version 5 submitted

Contributed paper selected for presentation at the IAMA World Food and Agribusiness Forum, 1999, Firenze, Italia. The authors are grateful for support from FAO and from National Science Foundation Grant No. SBR 9810149.

Strategic Roles of Food and Agricultural Standards for Agrifood Industries

1. Introduction

Food and agricultural standards (FAS) have been important for as long as food and agricultural markets have been important -- and each has been crucial to the existence of the other. They are in fact the underpinning of the "rules of the game." They are formulated, applied, monitored, and enforced by individual firms, trade associations, labor unions, consumer organizations, and governments and multilateral organizations.

However, the agrifood industry and market context in which FAS are formulated and implemented has changed radically over the past several decades. Important FAS strategic issues for managers in agrifood industries have emerged along with the radical shift in the context. This change in context has occurred in markets, policies, institutions, and technologies, as discussed below. The key point is that the situation has changed so that FAS have become increasingly important strategic tools for agrifood industries, and their roles have changed from the traditional roles.

But strategic analysis has not kept up with the changing context. Given that agribusiness and agricultural economics literature in the past has focused narrowly on the aspects of FAS as "neutral market lubricants" rather than on the determinants and impacts of FAS as strategic tools in agrifood industries, and given the complexities and novelties of the situation, we see an important gap in food and agribusiness management research and debate.

Hence, the purpose and structure of this short paper is to contribute to agrifood industry strategic thinking concerning: (1) the variables that classify FAS; (2) the changing context of formulation and application of FAS; (3) a conceptual framework for the strategic roles of FAS in the agrifood systems; (4) implications for agrifood industries of the emerging roles of FAS.

2. What are FAS? The variables that define and classify FAS

A given FAS is a set of specifications of a multi-element vector of variables. The seven categories of those variables are as follows. Change a specification on one variable and one has changed the FAS.

Outcome vs process. FAS can pertain to: (1) "outcome" (what characteristics the product (good or service) are expected to have when it reaches a certain point in the agrifood chain, such as when it is purchased from the farmer by the processor, for example how much pesticide

residue should be present on an apple's surface); (2) "process" (what characteristics the production process (for the raw product, the processing services, the marketing services, and so on) are expected to have either to control certain negative externalities (such as pesticide pollution) or produce certain outcomes (such as an "organically grown" apple)). An example of a process FAS is HACCP for livestock products in the US (see Unnevehr, 1999).

Agrifood Chain Level. FAS indicate characteristics of products or processes at each of the five pre-consumption levels of the following agrifood chain: 1) input supply to farmers; 2) farm production; 3) agro-processing (of farm output); 4) distribution of processed (and/or fresh) product; 5) preparation for consumption (such as in a restaurant); 6) final consumption. FAS are used by and implemented in interactions among actors at any or all stages of the chain (Eymard-Duvernay, 1995). Moreover, FAS are formed in these interactions and in interactions of actors in this chain with the government and other external actors such as environmentalist and consumer protection organizations.

Qualitative characteristics. FAS indicate characteristics that figure as: (1) "quality" (e.g., appearance, cleanness, taste), (2) "safety" (e.g., pesticide or artificial hormone residue, microbial presence), and/or (3) the 'goodness of the production process' (e.g. with respect to worker health and safety, workers' civil rights as in fair trade requirements, control of environmental contamination).

Quantitative/Statistical: FAS have quantitative aspects that can be classified as: (1) reference standards (that specify two categories of goods, below and above a given value); (2) ceiling or floor standards (that forbid products with attributes above or below a given value); (3) a specification of the acceptable range or variance around a floor or ceiling point; (4) specification of compatibility (for example compatible with x machinery type for processing)

Legal statu s: (1) de jure (legal/legislative by governments, or resulting from collective action e.g., within an industry); (2) de facto, initiated by an individual firm (e.g. by a supermarket chain) or arising from numerous non coordinated micro decisions in transactions.

Formulating entity: (1) private, (2) public.

Enforcement. (1) mandatory (sanctioned) versus (2) voluntary (non-sanctioned but "indicative").

There is yet another differentiation of FAS based on their strategic role, which we shall explore in the section 4 as it requires categorization of products and discussion of agrifood chain actors' strategies. Before that, however, we next explore the changing context of FAS to set the stage for discussion of their changing strategic roles.

3. The changing context of the formulation and application of FAS

The context that affects the strategic roles of FAS, in which FAS are formulated and implemented, comprise: (1) markets and consumer demand; (2) policies affecting markets and final demand; (3) institutions/regulations; (4) technologies. These variables affect strategic choices of FAS among actors in the agrifood chain (as well as others, such as governments) because they translate into the incentives and capacity variables that condition FAS strategic choices. The emphasis in this section is placed on changes in the market context, supported by changes in policies and institutions, and facilitated by changes in technologies.

Traditional context and traditional role of FAS

The "traditional" market context was a situation wherein homogeneous markets had as norms a standardized FAS for a mass commodity, and those FAS were themselves important to the rise of "mass markets" in the 19th and 20th centuries for several reasons:

(1) FAS served as regulators or "homogenizers" of the characteristics of items produced (hence standardizing so that economies of scale and market power could be attained), and

(2) FAS served as means of communicating those characteristics to buyers (processors and retailers and consumers).

(3) That communication reduced transaction costs (reducing the need for face-to-face transactions) and reduced risk (related to buyer's discovery of "substandard" and thus unusable items in a lot). Reducing transaction costs and risk made the marketing of large volumes of standard commodities possible, reduced the costs of processing, extended the geographic scope of a given market, and made product sources to a certain extent interchangeable, thus adding flexibility to the food system.

(4) Moreover, identifying standard commodities facilitated policy interventions (for example, floor or ceiling prices, tariff protection, support for breeding research, and so on).

Related to this traditional context, the primary, traditional role assigned to FAS in the agricultural economics literature has been that of facilitating the existence of and reducing the transactions costs of functioning of the product market (either for final or intermediate goods) (Hill 1993).

Changes in Context of FAS that challenge the traditional role of FAS

Several changes have recently marked agrifood markets.

(1) There has been a shift from homogeneous markets for several commodities to a proliferation, a differentiation of each commodity into many commodities (see Schertz and Daft, 1994). An example is corn, the market for which has differentiated into many markets for distinct types and/or qualities of corn for distinct uses (different types of corn as feed for different animals, for different type of processed corn products (cornflakes, flours, and so on), aimed at various niche markets both for food and industrial uses. Similar changes are occurring in dry beans with a differentiation of varieties to meet market niches (see Sterns and Reardon, 1999).

(2) The scale of the market is also changing, from agrifood firms facing national markets (with resort to international markets as the residual) to agrifood firms facing global markets.

These changes are related.

On the one hand, the differentiation of a given commodity market is itself facilitated by this shift to global markets (increasing the market volume for a specific variety of corn, for example, providing economies of scale in its marketing and processing); hence the political economy of GATT is supported by large agrifood firms with global aspirations or already realized global operations.

On the other hand, the differentiation of a given commodity is linked to diversification at the industry level (although it can imply specialization in a niche market for a given firm within the industry), meeting many market niches for a wide variety of types of consumers, which facilitates the increase in market size.

The above changes are due to three factors.

First, changes in consumption and consumers have driven the change. These demand-side changes have shifted product demand composition and diversity (which has increased the need for fragmented or differentiated markets, as in the case of the differentiated requirements of dry bean canners and processors), and the demand for evidence of food safety and the minimization of environmental impacts of agrifood production.1 It is important to note, however, that industry

¹ Note however that since the early 1900s consumers have demanded food safety evidence from industrial food systems, but that demand was routinely satisfied by the standard operating procedures of the agrifood system until the late 1960s and early 1970s when additives and subsequently pesticides became issues, and in the early 1990s when microbial contamination became an issue. Hence, demand for food safety has in a sense "differentiated" as with other markets, and has become more explicit and contested because the system is not routinely supplying it.

has not (always) been a passive recipient of these demand changes; sometimes the market changes are driven either by changes in potential supply whereby firms restructured markets for their own benefit (e.g., edible soybeans, high oil content soybeans).

On the one hand, the product composition of consumer demand has changed. Consumers, at least in OECD countries, have, on average, experienced a secular increase in real income (either from nominal income increase or a decrease in the average food price). As is predictable from Bennett's Law, this has induced a shift in demand toward:

(1) processed foods and prepared foods away-from-home (given an increase in the opportunity cost of women's time as women enter the workforce outside-the-home) and for

(2) higher calorie-price and variety foods (such as fruit, vegetables, animal proteins).

On the other hand, the "attributes" composition of consumer demand has also changed. Consumers exhibit increasing demand for:

(1) evidence of food safety (as they encounter new products or known products of new origin, and are unsure about their safety, or as they become more concerned about the effects on their health of the new farm, processing, or preparation technologies that permitted the increase in production and marketing); and

(2) better health, apparent for example in demands for nutritional labeling and in the industry focus on low-fat, low-salt, low-calorie, and 'natural' foods.

(3) a safer environment, and as derived demand, agrifood production processes that are "kinder" to the environment. The increase in demand for a cleaner environment is based on its being an amenity, and demand for change in agrifood production technologies to that end because richer societies use agrifood technologies that use chemical and biotechnological capital at a higher rate than do poorer societies.

Second, the market change has been affected profoundly by a shift from protected, limited national markets in a context of limited trade to a great increase in agrifood trade linked to trade liberalization and globalization brought on by GATT and the reduction of transport costs. Of course, GATT has taken place in a broader process of a shift over the past two decades in the degree and method of regulation of the economy by the government, from use of price controls, agrifood marketing boards and parastatals, export agencies, and so on, to new forms of governance and regulation, such as intellectual property rights and food safety regulation. Moreover, a set of former strategic instruments to maintain market share, limit competition, and

promote domestic agrifood firms (such as tariffs and quotas set by governments) were eliminated by this shift.

Third, there has been an improvement in the technologies available for product differentiation (at each stage of the agrifood chain), as well as advertising and communication technologies to communicate this differentiation to the consumer. Moreover, the rise of genetically engineered varieties that incorporate certain characteristics needed for a certain market (and the rise of IPR to protect those varieties from use by competitors) increases the ability to differentiate products.

The above changes in the scope of the market, in demand for product differentiation, in demands for product quality and safety and identity preservation, are causing a shift in the strategies of agrifood firms toward agrifood system strategies to enhance quality control and coordination. Hence, FAS need also to be seen in their role in the agrifood system. The next section explores those roles.

4. Analyzing strategic roles of FAS in agrifood systems

FAS have two general roles in the agrifood system: (1) FAS condition intra-industry coordination (in the sub-consumer levels of the chain, levels 1-5). FAS affect both the costs and risks of relations among firms at a given level of the chain and between firms at different levels of the chain. (2) FAS condition the relation of the agrifood industry with consumers (levels 1-5 with level 6).

However, it is important to note that FAS are but one instrument among several that constitute the governance structures that govern intra-industry and industry-consumer relations in an agrifood system. FAS are both substitutes for and complements to the other institutions and instruments in the governance structure. We explore this point in more detail in this section, proceeding as follows. First, we classify products (goods and services) in a way that will facilitate the discussion of FAS roles. Second, we discuss the strategic roles of FAS by type of product and level of the agrifood system (intra-industry vs. industry-consumer relations).

Building blocks for the discussion: distinctions among products: search, experience, and credence goods

We begin by making distinctions among products according to a classification that highlights the importance of FAS and the complementary mechanisms discussed below.

(1) A "search good" is one the quality of which the consumer is able to assess before buying it.

(2) An "experience good" (term introduced by Nelson 1970) is a good the quality of which the consumer discovers only after consuming it, because the costs are prohibitive of determining

before purchase the exact quality; before-purchase inspection may allow for identifying a given level of quality but not for discriminating between this minimum level and a higher level of quality.

(3) A "credence good" (term introduced by Darby and Karny 1973) is a good the quality of which the consumer never discovers (or only does so after a long time). There is need for expertise which can be provided by a set of public and/or private actors/institutions (certifying organizations, government programs...). In some cases, expertise is provided by the sellers themselves. Thus, the consumer's expected utility (safe food, sustainable agriculture, fair trade, and so on) is highly dependent on collective representation (e.g. the public's image of fresh produce as safe to consume) which may be considered to be a public good.

Of course, most credence goods have both search and experience attributes; An apple is a good illustration of this diversity of attributes: (1) the apple's color and size are search attributes; (2) the apple's taste is an experience attribute linked to its sugar rate and firmness; (3) the apple's safety is a credence attribute, as there is no clear relation between compliance with a given pesticide residue level and avoidance of cancer in the long term.

Hence, we use 'credence good' when there is a credence attribute involved (and thus expertise and trust in given expertise is required for the purchase to take place).

Governance Structures depend on the type of good

Williamson's governance structure typology² is useful to differentiate the way final transactions to consumers are governed according to the kind of goods: as a first approximation we may say that search and experience³ goods are governed by market mechanisms within bilateral coordination, and credence goods are governed by public and/or private complex governance structures (hybrid forms).

Public governance structures associate different sets of agents surrounding the transaction (between firms and consumers or between firms), such as government agencies, consumers' groups, NGOs, and industry associations. Private governance structures comprise tight

² A governance structure (Williamson, 1996) is: "... an institutional framework in which the integrity of a transaction, or related set of transactions, is decided." (p. 11) and "governance is the means by which order is accomplished in a relation in which potential conflict threatens to undo or upset opportunities to realize mutual gains." (p 12). "In the commercial sector, three discrete structural governance alternatives are recognized: classical market, hybrid contracting, and hierarchy." (p 378)

³ Except for perishable non-branded products where experience attributes need to be governed in complex hybrid forms, through a tight coordination between the different stages along the chain.

coordination intra-industry (within the agrifood system). The latter have become increasingly important with the changes in the food system discussed above. On the one hand, contracts are replacing spot market relations, as in the hog industry in the US (Martin, 1997). On the other hand, process FAS such as HACCP require traceability along an agrifood chain (Unnevehr, 1999). The upshot is that in private governance systems, the unit of analysis is not the final transaction (as in search and experience goods), but rather the sequence of transactions in the system. To build consumer confidence in industry-consumer relations in that context, tight vertical coordination is needed, which means a combination of different instruments/mechanisms (bilateral and multilateral, contractual and relational, built-in procedures, private and public ordering).

Role of FAS within Governance Structures of Agrifood Systems, with reference to type of good

The following are the key points concerning the role of FAS in the above governance structures.

Search and experience goods transactions. In these transactions, self-enforcing market mechanisms work well. Among market instruments are prices, FAS, legal penalties, specific investments that signal higher quality (in the case of experience goods). In this context, the element of risk is that a realized attribute will fall outside of the range of the 'acceptable' variance (which itself might be an explicit part of the FAS). Risk can be measured statistically and used over time to adjust contracts and relations (as well as the FAS themselves) where there is a verifiable gap (such as between the expected pesticide residue and the realized residue, or between expected water content of an industrial tomato and its realized content). In experience goods, FAS may be a way of better signaling quality, raising the observable prepurchase quality level and thus reducing advertising sunk costs (Klein and Leffler, 1981).

In search and experience goods transactions, FAS, together with prices, provide substantial information and create the conditions for almost perfect competition. The information level is even higher with advent of WTO intervention to remove trade barriers and harmonizing FAS (Stephenson, 1997). In theory, as a result of the relative efficiency of the market in these kinds of transactions, there is little incentive for non-industry institutions to represent consumers' interests. However, in practice, due to concentrated markets, there is room for firm strategic behavior in FAS definition on globalizing markets.

Credence goods transactions -- of growing importance in the new agrifood systems. FAS help reduce the unverifiable gap (between realized and signaled attributes) and increase consumer trust. Solutions depend on the kind of unverifiable gap wherein: (1) the effect of a deviation from a FAS is simply not understood (where the pesticide residue is perceived as "weighted by" the health effect of that residue, but that effect is unknown scientifically); or (2) the effect would be known if the deviation were measurable, but is not measurable due to lack of proper monitoring equipment or procedures; (3) the gap can only be observed well after the period of the contract or the consumption of the product.

FAS complements in the governance system of the agrifood system. The importance of credence and experience goods in the food industry has increased with the changes in the market context and in consumer demand (with many new products). Credence goods were already of greater importance for the food industry compared to other industries. As a function of the need to reduce transaction costs for contract formulation and implementation (hence their 'efficiency') and reduce risk in the presence of a high frequency of credence goods, the industry can specify FAS with differential informational power -- from nearly complete information to weak and variable information.

The former type of FAS, with strong information, together with prices, allows for efficient explicit contracts in search and experience goods transactions. The latter type of FAS, with weak and variable information, require complementary and costly institutional arrangements of the types discussed below to contribute to economic coordination in credence and experience goods transactions. The contribution of FAS to economic coordination implies the consideration of complementary institutional mechanisms and related enforcement procedures (built-in mechanisms, private and public ordering). FAS formulation and implementation involve different sets of economic and institutional agents: mostly industry ones for search and experience goods, and FAS, industry, government and consumer institutions for credence goods. There are several instruments complementary to FAS brought to bear where there is an unverifiable gap, as follows. (This is controlling for the sensitivity of the buyer to this unverifiable gap is a function of the desire on the part of the parties to the transaction to engage in future transactions.)

Advertisement. Where the effect is not understood but the supplier wants to minimize the buyer's sensitivity to this, advertisement is used (belittling the perception of possible health risk for example or underscoring the uncertainty of danger to the consumer or undermining the reputation of experts or research that suggests danger).

Trust. The existence of trust and consumer confidence in FAS signals conditions the FAS strategic choice, hence how much additional advertising is needed to make consumers trust what the FAS announce; of course, such advertisement might be seen as a substitute for FAS themselves (as in the case of local informal labeling or industry-generated certification, see Jank et al. 1999 for the case of milk in Brazil). Trust must be present for a transaction to occur where there is an unverifiable gap (that a contract cannot specify, hence the contract is incomplete), either in intra-industry relations, or in relations between industry and consumer. Trust is a relational mechanism that is the complement of a contract mechanism. Trust thus reduces transaction costs (of search, enforcement, and contract preparation) that are incurred due to incomplete contracts, because it makes possible the transaction with only a minimally specified contract (otherwise the contract becomes excessively long and costly to monitor and enforce). Also, links between buyers and sellers (such as in the yearly Quality Assurance Tour sponsored

annually by the Michigan dry bean industry that might further establish trust. Trust is based on the exchange partner understanding one's perception of the importance of certain attributes, as well as one believing that that partner will deliver these attributes.

On the one hand, although trust is thus a complement to FAS in a governance structure, trust and FAS are themselves correlated over time. A buyer's trust is built partly by observed sustained implementation of FAS with outcomes falling within the acceptable variance range. Consumers can increase their trust in an agrifood industry for that reason, an come to associate that trust with a brand name. The same can occur with any product or service user at any stage of the agrifood chain vis the supplier of that good at another level.

On the other hand, the actors choose FAS that comprise characteristics that they consider important to their relationship and their production processes and market relations, including their image and reputation. The FAS then represent the expectation of attributes of the product or service on which a given relationship is based – and that expectation is usually accompanied, explicitly in a contract or implicitly in an unspoken norm, of a "normal" variance around that expectation.

Changes in technology and verification processes. Buyers may chose to (and invest to) increase the degree to which they are able to minimize the unverifiable risk by increasing their ability to verify the presence of risk (by investing in pesticide monitoring equipment, for example). This option depends on the availability of technological information to increase verifiability (through adoption of monitoring equipment, through increases in scientific evidence showing connections between attributes and taste, health, and environmental impacts, and so on). When there is not a clear scientific basis and when beliefs are diverse, FAS formulation is difficult and controversial (debatable); thus different indicators may be chosen. FAS formulation and then enforcement is crucial to enhance consumer trust.

Impartial enforcement mechanisms. Complementary institutions and regulations, as well as government and consumer organization enforcement mechanisms subjectively "reassure" users (and objectively reduce the realized variance). These depend on effective and impartial contract enforcement mechanisms as well, usually maintained by government agencies.

5. Strategic implications for agrifood industries of the changing roles and contexts of FAS

Agrifood firms and industries will increasingly see FAS not just as "market lubricant" but as strategic arm in market conflict with other domestic and foreign firms -- as well as a tool to build trust and coordination within a given industry. Thus, agrifood industries have interests in influencing how FAS are formulated and implemented to affect their strategic position and to affect their consumer relations and product differentiation.

Agrifood firms are finding that both FAS and attention to increasing the consumer's trust in the industry's implementation of FAS are becoming important not just for demanding export markets but also for domestic markets (including in developing countries) that are exhibiting the above market shifts toward credence and experience goods. Bureau and Marette (1999) argue that changes in consumers' concerns such as those noted above have a strong impact (as consumers may be vocal or exit the market) on international trade via their differential preferences for food safety and quality; they contend that use of contingent valuation methods will improve our understanding of these preferences, especially with respect to willingness to pay. Moreover, Salay and Caswell (1998) argue that agrifood firms often think that the main consumer concerns with food safety and quality are in the international, export market, but that the domestic consumers also have these concerns and exercise their "dollar votes" in that regard, as they show in the Brazil case.

Two sets of strategic issues and implications emerge from the discussion above.

The privatization of FAS in the new market context ... complemented by a new role for public complementary institutions

There is a shift from public to private or mixed complex governance structures. Moreover, with the rise of private (as opposed to public) governance structures of agrifood systems, and in the presence of changing market scope and liberalization, there is an 'internalization' or privatization of FAS from public to private standards.

Before liberalization, there tended to be a link among three things – a homogeneous and relatively small national market, a set of FAS for a product that admitted to little product differentiation within the commodity category, and a government-regulated market (controlling prices, limiting imports, and so on). There is growing evidence that a typical situation post-liberalization is the following – a differentiated and 'globalized' market, a rejection or sidestepping of extant government-formulated FAS that are perceived by agri-food chain actors as limiting product differentiation (because undifferentiated FAS provide a disincentive or lack of incentive for product differentiation), and the rise of "industry FAS" that are set by contracts between agrifood chain actors either without reference to government-established FAS or with minimal reference to these. Hence, voluntary FAS are becoming a source of innovation and potential collective gain (they may respond with better anticipation to consumers' expectations).

However, there is a problem of the distribution of the gain (for instance between powerful retailers and small farmers) and as a problem of collective action for the whole industry to avoid a counter effect (too many and uncontrolled safety signals to consumers may induce increasing consumer distrust and debase fresh produce safety reputation). Such a counter-effect justifies the role of public (government, consumers, citizens...) institutions and thus mixed governance structures in credence goods markets.

The role of FAS as instruments to implement competition strategies is increasing

As the traditional instruments of domestic agrifood firm (and consumer) protection have been excluded (such as tariff and quota removal with GATT), FAS are becoming important instruments as "non-tariff trade barriers" (NTTB). That is, the perceived need for protection did not wane, but the instruments to effect it changed. Identifying and addressing NTTB has become an important strategic issue in trade negotiations, for instance, being a central theme of the next WTO negotiations.

This is both a policy issue and a strategic issue for agrifood firms, as firms militate for NTTB to protect domestic markets or militate against them to gain access to international markets. It will be very useful to discriminate between search and credence goods with the flip side of such a discrimination: what is search for some consumers maybe credence for others.

References

Bureau, J-C. and S. Marette (1999) "Accounting for consumers preferences in international trade," paper presented at the National Research Council Conference on Incorporating Science, Economics, Political and Culture in SPS and International Trade, Irvine, California, January 25-27.

Darby and Karny. 1973. "Free competition and the optimal amount of fraud," *Journal of Law and Economics*, 16: 67-88.

Eymard-Duvernay, F. 1995. "La Négociation de la Qualité," in Nicolas, F. and Valceschini, E. (eds). *Agro-Alimentaire: Une Economie de la Qualité*. Paris: INRA and Economica, pp. 39-48.

Grindley, P. 1995. *Standards Strategy and Policy: Cases and Stories*. Oxford: Oxford University Press.

Hill, L. 1993. "Grain Grades and Standards" in G.L. Cramer and E.J. Wailes (eds) *Grain Marketing*. Boulder: Westview Press.

Jank, M.S., E.MQ. Farina, and V.B. Galan. 1999. O Agribusiness do Leite no Brasil. Sao Paulo: Editora Milkbizz Ltda.

Klein, B. and K.B. Leffler. 1981. "The role of market forces in assuring contractual performance," Journal of Political Economy, 89(4): 615-641.

Martin, L.L. 1997. "Production Contracts, Risk Shifting, and Relative Performance Payments in

the Pork Industry." Journal of Agricultural and Applied Economics 29 (2), December: 267-278

Nelson, P. 1970. "Information and consumer behavior," *Journal of Political Economy*, 78(2), March/April: 311-329.

Salay, E. and J.A. Caswell. 1998. "Developments in Brazilian Food Safety Policy," *International Food and Agribusiness Management Review*, 1 (2): 167-177.

Schertz, L.P. and L.M. Daft. 1994. *Food and Agricultural Markets: The Quiet Revolution*. Washington: USDA/ERS.

Stephenson, S.M. 1997. *Standards and Conformity Assessment as Nontariff Barriers to Trade*. Policy Research Working Paper no. 1826. Washington: The World Bank, Development Research Group.

Sterns, P.A. and T. Reardon. 1999. "The Role of Institutional Change in Agrifood Industrialization: The case of Grades and Standards in the UK-US Dry Bean System," Contributed paper selected for presentation at the IAMA World Food and Agribusiness Forum, 1999, Firenze, Italia.

Unnevehr, L. (ed). 1999. *The Economics of HACCP: New Studies of Costs and Benefits*. Eagan Press.

Williamson, O. 1996. The Mechanisms of Governance. Oxford University Press.