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AGRICULTURAL STANDARDS

THE SHAPE OF THE GLOBAL FOOD AND FIBER SYSTEM

edited by

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DEDICATION

To Linda and Karen,
who always set high standards

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PREFACE

The Institute for Food and Agricultural Standards (IFAS) (www.msu.edu/~ifas) is a multidisciplinary teaching, research and policy analysis institute at Michigan State University (MSU) that focuses on the social, economic, political and ethical dimensions of the creation, enforcement and review of food and agricultural standards. From four faculty members and a small handful of graduate students, IFAS is now a part of a growing international network of scholars and practitioners.

IFAS was launched in 1999 with grants from the National Science Foundation (NSF), the Michigan Agricultural Experiment Station (MAES), and the MSU Center for Advanced Studies in International Development (CASID). The NSF grant (No. 9810149), "Making the Grade: Science and Values in Agricultural Grades and Standards," established the foundation for an international set of studies focused on identifying and analyzing: 1) the roles of science, technology, ethics and values in, as well as the sociopolitical dynamics surrounding, the creation, maintenance and modification of food and agricultural standards; and 2) accountability, transparency and democracy in standards setting and enforcement. This grant funded studies in the United States as well as studies of cotton in Mali and soybeans in Brazil. Additional funding from the MAES supported studies of dry beans, potatoes and grapes in Michigan, while CASID supported a seminar series, "Standards in Everyday Life," during 1999 and 2000.

An NSF training grant, "Societal Dimensions of Food and Agricultural Standards," provided two graduate fellows and one post-doctoral fellow the opportunity to incorporate multidisciplinary perspectives and skills into their more discipline-based studies in order to grapple with normative issues raised by grades and standards in an increasingly global and differentiated food and agricultural system. In addition, NSF and Fulbright dissertation fellowships enabled graduate students to complete studies of the red meat industry in South Africa and the wholesale vegetable market in São Paulo, respectively.

Finally, IFAS directly addresses the relationships between food and agricultural standards, international trade, and development through two projects funded by the

US Agency for International Development. The Partnerships for Food Industry Development - Fruits and Vegetables (PFID - F&V) (www.pfid.msu.edu) is a global project aimed at helping small farmers to compete in local, regional, and international markets by meeting the appropriate standards. The RAISE SPS project, a multi-institutional project for which MSU has the technical lead, consists of a series of studies addressing sanitary and phytosanitary standards in developing nations. Both of these projects are jointly administered with MSU's Institute of International Agriculture.

With funding from Michigan State University, the German Marshall Fund, and the Farm Foundation, IFAS hosted an international workshop, "Markets, Rights and Equity: Food and Agricultural Standards in a Shrinking World" in the Fall 1999. Seventy participants from twenty-two countries came together for three days to analyze standards setting, implementation and the effects of standards in the global context of increased agricultural trade and lower trade barriers. During the workshop, the participants developed policy recommendations oriented toward producing effective, equitable, and transparent standards for our food and agricultural system in the 21st century. The workshop made four recommendations: 1) the need for more democratic mechanisms in international standards setting; 2) more complementary standards setting between private and governmental standards agencies; 3) more research to promote equitable standards setting and to improve understanding of the diverse impacts of standards; and, 4) revisions to the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT).

The papers presented and the discussions at this workshop motivated the preparation of this volume of essays. In short: this volume has endured a very long birthing and we are deeply grateful for the patience and forbearance of all the authors, some of whom have waited over two years for this publication. Given this long delay, we are especially appreciative that all of the authors reviewed and brought their chapters up-to-date.

Over the long time from idea to realization we must acknowledge the invaluable intellectual contributions from our colleagues. As found in many shared endeavors that span several years of countless brainstorming sessions, the attribution of authorship for a particular concept or approach often becomes collective. While this has certainly been the case for IFAS, we must acknowledge the very special roles of our founding colleagues at IFAS, Tom Reardon and Craig Harris. Tom's quick and incisive insights were instrumental in helping us to frame our approach and to structure sets of ideas coming from divergent economic, sociological and policy analyses. Similarly, Craig has always been there with key questions forcing us to re-think cherished assumptions and with the keen editorial sense that consistently improved the presentation of our ideas. In addition, we were fortunate to benefit from, and be informed by Brady Deaton's research and writing on the institutional economics of food and agricultural standards during his post-doctoral affiliation with IFAS.

We continue to depend upon the enthusiasm and intellectual curiosity of the graduate students from several disciplines who have been integral to shaping the research program of IFAS. Some of them are contributors to this volume, and most

have publications dealing with food and agricultural standards. For enduring our numerous meetings, but always challenging us with fresh questions, we want to acknowledge the contributions of Brikena Bali, Sherlyn Bienvenida, Holly Dygert, Ivan Ivanov, Chet Kendell, Jason Konefal, Michael Mascarenhas, Gerad Middendorf, David Randals, Elizabeth Ransom, Taylor Reid, Tonya McKee, Jacquelyn Miller, Maite Salazar, Andile Siyengo, Patricia Aust Sterns, and Michelle Worosz.

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The preparation of the final manuscript was made possible only through the indispensable assistance from Richard Campau, MSU Office Services, Deborah Doherty, Springer Author Support, and Natalie Rieborn, Springer Humanities Department.

We are especially pleased that Michiel Korthals and Paul B. Thompson accepted this volume as part of the International Library of Environmental, Agricultural and Food Ethics. We hope we have been faithful in responding to the valuable comments from two anonymous reviewers.

We also want to thank the various funding agencies and their program officers who have supported our work over the last several years. Without their generous support, much of the work reported here would not have been possible. Of course, we, the editors and authors, are responsible for any errors of commission or omission.

Finally, we want to thank all of those in national and international private and governmental “standards agencies” from whom we have learned so much over the years, and for whom we hope this volume serves to recognize and appreciate their service and contribution.

Jim Bingen
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I

THINKING ABOUT STANDARDS

LAWRENCE BUSCH* AND JIM BINGEN†

1. INTRODUCTION:

A New World Of Standards

Standards are the measures by which products, processes and producers are judged. Grades are the categories used to implement the standards. In the not too distant past, all grades and standards (G&S) were determined locally and informally, often between the parties to an exchange. In the early twentieth century, it was claimed that good quality wheat could be determined by anyone with patience and a good set of teeth (Buller 1919)! Today formal G&S are ubiquitous in the world. They affect the production, processing and condition of things, and also the judging of human performance and worth. Thus, there are G&S for apples, ketchup, toxic chemicals, and endangered species as well as for new entrants to graduate school, pesticide applicators, food handlers and government food inspectors. G&S may be set by publicly accountable government bodies (e.g., United States Department of Agriculture), by industry groups (e.g., National Food Processors Association), nonprofit organizations (e.g., Social Accountability International) or market leaders (e.g., McDonald's). G&S are of particular importance in an era marked by restructuring economies and polities from planned to market driven, and by increasing global trade and competition (OTA 1992). In a market economy, G&S define what is to be traded on the market (e.g., soybean standards), establish agreed upon conventions to order production processes (soybean meal processing), fix levels of consistent product quality (though not always the highest quality), and make possible the location of production around the globe by ensuring compatible products and processes (pallets and shipping containers).

The study of standards would seem to be a dry and rather narrow topic. Indeed, were they to be discussed from a solely technical point of view that would surely be the case. Who, other than the most specialized of practitioners, would be concerned over the determination of the best test for the *Salmonella* count on chickens, or the specification of the maximum allowable pesticide residue on fresh vegetables, or the wavelength of the precise shade of red considered desirable for tomatoes? This is the stuff of specialists and is far removed from the concerns of ethics, politics, economics, or of the larger society. Or is it? In this volume, we argue and provide several case studies showing the significance of understanding food and agricultural standards within a far broader social and ethical context, one which touches on many

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of the questions that concern us individually and collectively in a most profound way.

1. STANDARDS: A BRIEF HISTORY

Standards have been around for a long time. When ancient Egyptian priests counted the *hekats* (~4.6 litres) of grain in the royal storehouses, they employed standards of volume. Such standards not only permitted a clear accounting; they ensured that tax collections were consistent over time and space. Two thousand years ago, Virgil (1982) railed against the lack of standards that led to watered down wine, adulterated olive oil, and sundry other products. During the Middle Ages, cities set the length of a yard of cloth or the size of a bushel of grain based on the amount of work that an average weaver or farmer could do in a day. In fourteenth-century Venice new accounting standards developed including double entry bookkeeping – standards that permitted new approaches to business, including new concepts of profits (Swetz 1987). In Bavaria, a 1516 law created standards for beer requiring that only three ingredients be present: water, hops, and barley. Its express purpose was maintaining the purity of the brew.

For years as well, many benefited from the myriad of conflicting standards. For example, in eighteenth century France there were some 700 to 800 weights and measures with more than 250,000 variants. Measures were usually inextricably linked to particular objects. Thus, measures of wheat differed from those of barley, based on how much labor was required to produce a given measure (usually some fraction of a day's work at harvest). Trade was facilitated by taking advantage of the differences among the measures in different regions. Thus, a merchant might purchase three measures of wheat at a given and usually fixed "just price," in one town and sell four (smaller) measures with the same name in another town for the same price. The metric system met with considerable resistance even in Paris, where it originated during the French Revolution. Only in the 1840s did the French succeed in eliminating that resistance, requiring the use of the metric system throughout the nation (Adler 1995). And, even today, French shoppers at open air markets will demand *une livre* (one pound) of fish or meat, although the *livre* has been conveniently redefined as 500 grams.

As world trade began to grow in the eighteenth century, nations rapidly developed standardized weights and measures. Such measures were often met with stiff resistance from those who benefited from the myriad conflicting standards of earlier years. This resistance to changes in standards was not merely a matter of traditionalism. Standards are all about power – most obviously the power to determine what shall be sold on the market, but also the power to count, to tax, to observe, to record, and to rule (Scott 1998).

In other words, standards are commonplace in all aspects of social life, and as Walzer (1983: 10) has argued every set of goods is a distinct distributive sphere:

There is no single standard. But there are standards (roughly knowable even when they are also controversial) for every social good and every distributive sphere in every particular society; and these standards are often violated, the goods usurped, the spheres invaded, by powerful men and women.

Walzer goes on to note that there are three universally recognized but rather different distributive principles – principles that sometimes overlap, but more often stand on their own. They are:

1.1 *Free Exchange*

Which may be defined as the open exchange of goods in a market. Markets are quite obviously distributive in nature. Moreover, they distribute based on a combination of wants (but not necessarily needs) and ability to pay. As we shall see below, a good standard for free exchange is (at the very least) one that permits and even encourages free exchange. In most contemporary societies free exchange is seen as desirable principle of distribution. But as the great Chinese sociologist, Fei Shaotong (1992 [1948]) reminds us, in many traditional societies, including that of rural pre-revolutionary China, all exchange within villages was gift exchange. Markets were usually placed outside of village environs where one could trade with strangers “without human feelings” [*wuqing*]. Similarly, in medieval Europe the notion of a “just price” was designed to limit the scope of the market so as to achieve other desired social ends.

1.2 *Dessert*

May be defined as the distribution of goods according to how much one deserves a particular good. Standards for things such as awards, medals, public recognition of great skill or courage, or conversely, prison sentences for those guilty of crimes, involve providing persons with their just desserts. Quite clearly, it is widely agreed that free exchange should play virtually no role in the creation or enforcement of such standards; to the extent that it does, it violates the principle of just desserts. But determining who should receive what desserts is often subject to abuse. A most egregious example in modern times would be the apartheid system in South Africa. Proponents argued that people of different racial groups *deserved* different treatment under the law (see, for example, Bowker and Star 1999). The same misuse of dessert was evident in the American treatment of citizens of Japanese origin during the World War II (Hata, Hills and Hata 1995).

1.3 *Need*

Standards for need are also commonplace in modern society. For example, scholarships, food stamps, Medicaid, and public housing are normally assigned based on written standards focused on need. Clearly, one should not be able to buy these goods, nor are they normally distributed based on dessert.¹ International treaties as well, often talk of need. For example, the right to food, enshrined in

United Nations documents, is based on the principle that food should be distributed based on need.

In this volume we focus on food and agricultural standards – standards that involve the free exchange of goods. As the reader shall see, a wide range of issues of distributive justice, of rights, of equity, and of virtues, are endemic features of food and agricultural standards, even though they are not ostensibly what such standards are about. Questions of desert and need enter into the discussion as well, especially when free exchange is used to justify practices that ignore these distributive principles.

2. STANDARDS AND STANDARDIZATION

Standards and standardization were inseparable in the development of many of the first standards. Weights, measures and coinage appeared thousands of years ago as means of standardizing, of creating order out of chaos, and of facilitating trade and taxation. The Swiss-born republican, Benjamin Constant, understood this clearly when he wrote:

The conquerors of our day, peoples or princes, want their empire to possess a unified surface over which the superb eye of power can wander without encountering any inequality which hurts or limits its view. The same code of law, the same measures, the same rules, and if we could gradually get there, the same language; that is what is proclaimed as the perfection of the social organization...The great slogan of the day is uniformity (quoted in Scott 1998: 30).

Adam Smith (1994 [1776]) was one of the first persons to theorize about standards as they applied to production and trade, albeit in a rather oblique manner. Smith chose a pin factory as a means to illustrate several points in his theory. The standardized products of the pin factory (according to Smith made in 18 steps) employed the division of labor to achieve greater productivity. Smith claimed that the pin factory permitted (1) greater dexterity on the part of workers who now only had to learn a few skills, (2) the saving of time between tasks, and (3) the greater use of machines to substitute for labor. Of particular note is that he chose an industry that was somewhat of an exception in his time. Had he examined the furniture or carriage making industries, he would have found a far less developed division of labor, fewer standards, and little standardization. And, agriculture, Smith lamented, was not subject to the same division of labor as the emerging world of industry.

Napoleon provided a boost to standardization by virtue of his military ambitions. Developing a modern mass army of conscripted men required tens of thousands of uniforms, guns, and ammunition. It required standardized rations that would not spoil on long marches. Canning was developed by Nicolas Appert in 1806 in response to Napoleon's call for better means of standardized food preservation. Thus, by introducing standardized mass production, Napoleon was able to rapidly feed, clothe, and arm his armies.

Standardization rapidly caught on in manufacturing in the nineteenth century, especially in the United States (Habakkuk 1962). The use of standardized (and hence interchangeable) parts proved to be a boon unto itself, as it facilitated repair of all

sorts of manufactured goods. The practice became so widespread that it became known worldwide as the American system.

But Smith's theoretical insights with respect to standardization lay largely unexamined until the early 20th century when engineers began to exploit the potential benefits of standardization. For example, Frederick Winslow Taylor developed his program of scientific management (Taylor 1911). For Taylor, there was a single best way to accomplish any task, and it was engineers who would determine what that best way was using the principles of science. No longer would it be necessary to rely on the rules of thumb developed by workers; engineers would use a variety of techniques, including time and motion studies, to determine the most efficient way to accomplish a given task.

Taylor's approach sparked a spate of books, pamphlets, and management advice. Taylor's system was to be applied to the farm and the home as well as the factory (Jones 1917 [1916]). Agricultural economist, Milburn Wilson, formed Fairway Farms in 1933 with the express idea of applying Taylor's ideas to agriculture.² "It was 'a scientific and carefully planned effort to transfer the industrial efficiency of modern factory methods to the farm...'" (Kirkendall 1966: 13). Similarly, home economists embraced the standardization of the kitchen as a means to reduce the labor required to prepare meals. In an age when working class women were entering the labor force in record numbers, such standardization was seen as freeing up female labor for paid work outside the home. Not surprisingly, standardized recipes tended to be simpler and required fewer ingredients, but at the same time, they allowed easy calculation of nutritional value, making them of particular interest to nutritionists (Levenstein 1988). And, as late as 1973, a manual on the fast food industry quoted Taylor with enthusiasm. Indeed, as the Operations Manager at Burger King noted, "...fast-food restaurants operate like manufacturing plants today – not restaurants..." (quoted in Reiter 1991: 112).

Marketing, too, could be standardized. The emergence of marketing as a separate field of study in the early twentieth century was heavily influenced by, and was a part of the trend toward standardization. Even the terms of marketing were subjected to standardization by 1930. As one observer has noted, "With marketing, the circle of scientific management was closed: the whole economic *circuit*, from each business to the big market, was amenable to a systematic control – marketing was smoothly but surely sliding from microeconomics to macroeconomics" (Cochoy 1998: 205, emphasis in original).

Herbert Hoover, also an engineer, became convinced that the road to prosperity was to be based on standardization. Hoover became perhaps the most ardent advocate of standardization the world had ever known. For Hoover, factories themselves needed to be standardized. Efficiencies would be achieved by factories built according to a scientifically determined design, using equipment that was equally standardized, with standard jobs and standard organizations. Yet, Hoover was unaware of how standardizing factories would stifle innovation and perpetuate whatever inadequacies those factories had (Krislov 1997).

Enthusiasm with standards and standardization was not limited to the capitalist world. Lenin saw Taylorism as a central part of his program of rapid modernization of the Soviet Union. As he put it, "We must organize in Russia the study and

teaching of the Taylor system and systematically try it out and adapt it to our purposes” (Lenin 1937: 333). Gosplan, the great Soviet bureaucracy in charge of planning, was headed by technical specialists with strong Taylorist views. Alexei Gastev, head of the Central Labour Institute, saw Taylorism as crafting the new proletariat that would build a prosperous Soviet Union (Bailes 1977). Under Stalin, the situation hardly changed. Wages were set using Taylorist principles. Henry Ford, one of Taylor’s greatest admirers, had technical aid contracts with the Soviets through the 1930s (Bailes 1978). Hoover’s book so impressed the Soviet elite that it was translated into Russian (Bailes 1974).

Even radical critic Thorsten Veblen was a great admirer of standardization. Veblen (1921) argued that since engineers were in charge and could increase productivity several fold if given the opportunity, the solution to the problems of capitalism was for the engineers to take control away from the “absentee owners.” For him, standardization merely exacerbated the problems of industry by showing in stark relief how useless the capitalist class really was and how it had to restrict production in order to maintain control. Freeing the engineers from capitalist limits, and promoting widespread standardization, would bring unlimited abundance and the end of capitalism.

3. STANDARDS WITHOUT STANDARDIZATION

But standards do not necessarily make for standardization. They have had other meanings for some time. For example, companies like Standard Oil and American Standard have names that reflect not the desire for standardization, but the wish to be “the” standard, to be the best in the field. They drew on an older meaning of the term standard, meaning the banner at the top of a pole, used as a rallying point in battle. They claimed to lead their respective industries, not to merely meet some existing standard.

More recently, standards have been linked to product differentiation. For example, Henry Ford insisted that one could buy his Model T in any color, as long as it was black. Meanwhile, another vision for standards was being developed in another Detroit neighborhood – that of General Motors. Alfred P. Sloan, Jr. became President and Chief Operating Officer of General Motors in 1923 and proposed to use differentiated standards to segment the automobile market. By the end of the decade, General Motors sales had eclipsed those of Ford, and the company soon became the single largest enterprise in the world. Standards played a key role in this endeavor.

Food processors had begun to differentiate their products even before Sloan began to reorganize General Motors. Indeed, the H. J. Heinz Company was among the first to differentiate its products (Levenstein 1988). In 1896, the company’s slogan, “57 Varieties” was festooned on every jar of pickles they sold. But such remained the exception until the latter half of the twentieth century. Then, food processors moved from having a few products, to inundating shoppers with a seemingly endless variety of processed foods. Importantly, that diversity was achieved by the creation of myriad specialized standards, each differentiated from

others. Doubtless, the widespread adoption of Sloanism in food processing had to await the invention of the supermarket. Supermarkets offered the newly mobile suburbanites of the 1950s larger stores with a far greater diversity of products than the local grocer. Today, food processors produce thousands of new products each year, each attempting to further segment the market, each conforming to another standard.

In their Sloanist reshaping of the food supply, food processors had relatively little effect on agricultural production. In part, this was because food processors – a highly concentrated industry – continued to demand undifferentiated bulk commodities from suppliers. Even when new technologies have permitted greater differentiation among commodity suppliers, processors have resisted the use of those technologies. For example, soybean standards have been in existence for nearly a century, but the key aspects of soybeans of interest to processors – oil and protein content – have until recently been impossible to measure cheaply and rapidly. Yet, Hill (1994) notes that many in the soybean industry have resisted the use of new technologies to differentiate soybean quality by oil and protein content, even though it is now widely available and is relatively inexpensive. There are several different reasons why this is the case. First, the new technology would increase the ability of those farmers with high protein/oil soybeans to bargain with processors. Put differently, processors prefer to buy an undifferentiated product at a low price and sell a highly differentiated product at a high price, thereby capturing the added value at the processing stage. Second, farmers who, for whatever reason, were unable to produce high protein/oil soy would be at a disadvantage in a differentiated market.

For somewhat different reasons, fast food operators have remained highly Fordist in their approach to food production. Most of the larger fast food chains have very limited menus, differentiating meals largely by size. At the same time, they have been more than happy to impose strict standards on their suppliers. For example, McDonald's only uses Russet Burbank potatoes for its french fries. These oblong potatoes minimize waste for McDonald's while they permit the production of long narrow fries. Moreover, McDonald's is apparently pleased by their uptake of cooking oil during the frying process. Similarly, when various animal rights organizations picketed McDonald's over the treatment of chickens bound for McDonald's sandwiches and "McNuggets," the company imposed strict new animal welfare standards on its suppliers, restricting significantly the degree to which chickens could be de-beaked by suppliers. Other fast food chains quickly followed suit (Barboza 2003). However, some of the medium priced chains have begun to borrow a page from Sloan. They offer a varied menu but use a rather short list of ingredients. Whether this signals a trend for future fast food is unclear.

A much more recent change in the food system is the development and enforcement of private standards by supermarket chains. Until recently, supermarkets tended to remain within their country of origin. Tariffs and quotas on food imports limited the profitability of cross-national chains. But the formation of the World Trade Organization transformed the rules by which supermarkets had to source their products. Today, supermarket chains traverse the globe. Three companies stand far above the others, in terms of both sales volume and number of nations in which they operate: Wal-Mart (US), Carrefour (France) and Royal Ahold

(Netherlands). Numerous other firms have stores and/or subsidiaries in several nations. All the larger chains source globally in ways they did not (and could not) in the past.

As these chains have grown in scale, they have changed the way in which they source their products. The very largest chains can and do dictate their terms not only to farmers but to food processors. For example, Danone yogurt disappeared for several months from Wal-Mart's shelves in Mexico as a result of a price dispute with that firm (Smith 2002). In contrast, independent supermarkets and small chains tend to buy on the spot market or through food brokers. Supermarkets have also banded together to introduce a variety of industry-wide standards for producers. These include:

EUREPGAP. The European Retail Produce Working Group (EUREP), an association of European retailers, has produced a common set of standards – in the form of Good Agricultural Practices (GAP) – for food safety, food quality, environment, and labor that will shortly be required of all producers (EUREP 2002). Thus, whereas nations and international organizations have been reluctant to go beyond food safety, EUREP has brought environmental and labor issues to the center of the global debate. Of course, it is unlikely that the Boards of Directors of these firms woke up one morning to great concern over either the environment or farm labor. Far more likely, they realized that (1) a significant portion of their customers cared about these issues, and (2) the cost of compliance would have a negligible effect on the cost to consumers of food. On the other hand, the consequences for producers have been substantial, a point to which we shall return later.

COLEACP. The *Comité de Liaison Europe, Afrique, Caraïbes, Pacifique* is partly funded by the European Union and has as its goal, the reduction of pesticide residues in food products (COLEACP 2002). It does not so much set standards as it helps suppliers in Africa, the Caribbean, and the Pacific to meet European standards for maximum pesticide residues.

CIES Food Safety Initiative. CIES, the Food Business Forum, is a global association of food retailers and processors (CIES 2002). Its membership encompasses all the major supermarket chains in the world. Through its food safety initiative it intends to develop a set of meta-standards that encompass all the standards of the major food importing nations of the world. In doing so, it intends that producers would have to be certified only once to ensure compliance with food safety standards in Europe, North America, and Japan.

Others have adopted broader private standards including:

3.1 ISO 9000 and ISO 14000

The International Organization for Standardization (2002), a non-profit organization, has issued a series of management standards known as the ISO 9000 series. These standards focus on good management practices – means by which an organization can be run to ensure that high quality products or services will be produced. The standards are generic and can be applied to any organization within or outside the

agrifood sector. The ISO 14000 standards focus on good environmental practices. Many agrifood organizations have adopted ISO 14000 as a means of reducing environmental pollution as well as of demonstrating their concern for the environment.

3.2 *SA 8000*

The SA 8000 standards were developed by Social Accountability International (2002), an NGO concerned about human rights. SA 8000 standards cover a range of issues from minimum wages, to worker rights, health and safety. Many producers have adopted SA 8000 to demonstrate their fair treatment of workers.

3.3 *Fair Trade*

In recent years a number of organizations have sprung up in both the US and Europe that argue for what has come to be called fair trade (e.g., Fair Trade Federation 2004). The central concern of fair trade advocates is that producers in developing nations should receive a fair and just return on their products (i.e., what they deserve), rather than being forced to accept low prices by the vagaries of the market. Many of these organizations maintain their own shops where various food and non-food products are sold. In general, such shops tend to sell shelf-stable products (e.g., coffee, tea) that require minimal infrastructure at the downstream end of the supply chain. Fair trade advocates have also been successful in getting some fair trade products onto supermarket shelves, especially in Europe.

Compliance to these and other private standards is rarely required by law. More frequently, compliance is required in order to effectively participate in a given market, while in a few instances compliance is entirely voluntary and may be seen by participants as a means to build market share (Caswell, Bredahl and Hooker 1998). But in nearly all cases, compliance must be measured by some external group if it is to be credible.

4. THE STANDARDS COMPLEX

Virtually every aspect of food and agricultural production, processing, transport, and retailing is subject to one or another set of standards by a myriad of government agencies and/or non-governmental bodies. This poses problems of multiple agencies with overlapping jurisdictions. Standards may also differ in scope and specificity. There may be conflicts among standards and standards bodies. Furthermore, standards may place unexpected constraints on farmer decision making. Let us consider each of these in turn.

4.1 Multiple Agencies

Given the diversity of standards which pertain to US fruits and vegetables, it is not surprising that they are the responsibility of many agencies, e.g., the Food Safety and Inspection Service, Food and Drug Administration, EPA Office of Prevention, Pesticides and Toxic Substances, regional marketing commissions and commodity groups, major processors and distributors and several international agencies (Nichols 1996). Each of these agencies and organizations has different, although sometimes overlapping jurisdiction with respect to G&S.

4.1 Differences in Scope and Specificity

For example, organoleptic standards for fruits and vegetables may be explicit (e.g., sugar concentration) or embodied in varietal specifications (e.g., Fuji apples). In addition, (sometimes different) federal and state environmental standards limit what compounds may be used for pest control and rates and times at which they can be applied. Regulations also specify the protections, amenities and accommodations which must be provided to hired agricultural workers. Other G&S may cover production practices as a whole (e.g., organic produce), or the social relations of production or exchange (e.g., Community Supported Agriculture).

4.2 Conflicts Among Standards

Given the proliferation of standards, standards can and do conflict with each other. For example, fruits and vegetables constitute one of the most dynamic standards arenas in US agriculture (Bordelon et al. 1997). Advertising emphasizes the superiority of products that conform to certain standards of size, shape and color. These standards have been codified for purposes of international trade (Organisation for Economic Cooperation and Development 1983). Concern about the safety of fruits and vegetables from chemical and biological contaminants has existed since the late 1800s, but has recently increased with outbreaks of fruit- and vegetable-borne diseases (Tauxe et al. 1997). These two emphases create contradictory pressures within the fruit and vegetable industry: efforts to produce cosmetic perfection by applying high levels of pesticides result in concern about toxic effects of residues (Pimentel, Kirby and Shroff 1993), especially for groups with high sensitivity (e.g., children, National Research Council 1998). Furthermore, efforts by producers to meet cosmetic G&S for fruits and vegetables by using high levels of insecticides may have negative impacts on beneficial organisms as well as on groundwater supplies. Yet, in some areas, pests that cause major economic damage are controlled by pesticides for which there are currently no alternatives (Harris and Whalon 1995); if new standards make it impossible to use those pesticides, production will shift to other regions where those pests are not a threat.

4.3 *Standards' Effects on Decision Making*

In recent years it has been claimed that stringent standards for fruit and vegetable safety from microbial contamination, and especially the mandating of particular production processes for accomplishing those levels of safety, will make it impossible for small-scale operations to be profitable. Similarly, standards for farmworker protection and accommodation may influence farm operators' decisions to replace hand harvesting with mechanical harvesting (Friedland, Barton and Thomas 1981), thus both limiting employment for farm laborers and increasing machinery sales. Standards for environmental and farmworker protection may restrict a grower's options for pest management to a subset of more expensive alternatives; this may have the effect of shifting production to other locales where those standards are not in effect. As a result, there may be less farmworker employment in the US and higher levels of pesticide risk in the exporting countries (Thrupp 1995). On the other hand, the establishment of federal organic standards may result in the greater availability of organic fruits and vegetables, thus leading to a reduction in the consumption of pesticide residues by US consumers (Harris et al. 1998).

5. THEORIZING ABOUT STANDARDS

So how do we organize the study of this incredibly diverse and complex world of standards? G&S are implicated in decisions about who shall participate in decision making and who shall get to produce what, as well as in issues of distributive justice, and what constitutes the good life. To illustrate:

(1) Not everyone is admitted to the *negotiations* leading to the creation, modification or maintenance of G&S. Most standards are produced by technical committees that pay scant attention to the needs or desires of other groups not represented at the negotiating table. Moreover, negotiations are not limited to the creation of the standard which is then applied rubber stamp-like everywhere. Standards are always applied locally, and in their application there is always and necessarily negotiation. For example, grain elevator operators are likely to be more willing to accept grain of marginal quality when supply is short than when it is abundant. Similarly, they are more likely to accept grain that barely meets the standard from a large producer than from a smaller one. After all, they need the grain from the large producer in order to maintain their business – and they want that grain year after year. Clearly, who participates and how much say and sway they have in negotiations is a central issue of fairness and self-governance.

(2) Although G&S make the rules for entry into a given market transparent, they may also (intentionally or not) allow or deny *access* to particular product or labor markets. Those with insufficient capital or lack of certain raw materials may be blocked from entry to certain product markets. Similarly, others may be blocked from entering certain labor markets based on failure to obtain the necessary educational certificates (another standard) or, more insidiously, by virtue of their identification with a certain race, ethnic group, or gender. Similarly, G&S may be