Food Marketing Policy Center

Variation in Organic Standards
Prior to the National Organic Program

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Research Report No. 72
2002

Research Report Series
http://www.fmpc.uconn.edu

University of Connecticut
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Contents

List of Tables and Figures

Acknowledgement

This research was supported by the USDA Fund for Rural America Grant entitled 'Market Development for Organic Agricultural Products: Implications for Domestic Markets, International Competitiveness, and Rural Communities'. It was also supported by a USDA Cooperative State Research, Education, and Extension Service (CSREES) Special Grant to the Food Marketing Policy Center, University of Connecticut and by subcontract at the University of Massachusetts, Amherst.

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Preface

Interest in establishing nationally uniform certification, labeling, and management standards for organic products grew out of concern that the existence of multiple standards led to consumer and supply chain confusion about, and lack of confidence in, these products. The National Organic Program Final Rule, issued in December 2000, is the result of this interest. We analyze the certification system that was in place prior to the new national rule to evaluate the extent of differences between certification standards and how the national rule is likely to impact the market for organic products. Our analysis suggests that most differences among US certification standards were minor. Also, the most important impacts of the national standard may be in facilitating trade in ingredients and products certified by different certifiers, increasing buyer confidence, and facilitating exports. However, the national rule may decrease the ability of organic certifiers and consumers to place differing emphasis on the multiple goals of organic production and may decrease the flexibility of organic standards to respond to changing market conditions, including new technologies.

Key words**:** organic agriculture, organic certification standards, organic labeling, organic market

1. Introduction

The 1990 Organic Foods Production Act (OFPA) instructed the US Dept of Agriculture (USDA) to write a national standard for organic production. Proponents of the OFPA argued that in the growing market for organic foods, confusion reigned over exactly what 'organic' meant. They said a nationally uniform standard would improve welfare by eliminating confusion among consumers, reducing transaction costs for processors and handlers of organic foods, and providing other benefits. The National Organic Program (NOP) Final Rule, issued in December 2000, was the culmination of 10 years of often-contentious work by the USDA with organic producers, certifiers, consumers, and other interested parties.

Here we analyze the certification system in place prior to the national rule, to evaluate the extent of differences between certification standards and how the national rule is likely to impact the market for organic products. Part I presents an overview of the organic products industry and the regulatory system prior to the national rule. Part II is a comparison of 18 organic certification programs in use in the late 1990s and three certification programs designed for national or international use. Part III presents an evaluation of how the national rule is likely to impact markets for organic products.

2. Regulatory Background of the Organic Industry

Until the late 1980s, most organic food was sold close to the point of production and personal trust between consumers and producers functioned fairly well as a guarantee of organic quality (Hall, 1997). As organic foods traveled greater distances, consumer, producer and other groups offered organic certification as an independent, third-party (i.e., not by the buyer or seller) guarantee that only organic methods and materials were used on products labeled organic. By 1998 at least 55 organic certifiers operated in the US (OFRF, 1999). These certification organizations generally varied according to regions rather than products they certified.

Before 1990 there was little state regulation and no federal regulation of the term 'organic'. Labeling fraud was probably infrequent, but there were other negative consequences of the lack of standardization. Processors found it difficult to produce foods with ingredients certified by several different agencies because the processor's certifier sometimes refused to accept another agency's certification. Some producers were concerned about other organic producers receiving the same price premium while following less strict production standards. Some also worried that the appearance of loose regulation might harm consumer demand for their products and the ability to export. Attempts by the organic community to agree on minimum production standards and agency operating procedures were unsuccessful, and in the late 1980s some industry members lobbied Congress to pass a law requiring that all products labeled 'organic' be certified to meet federally sanctioned standards. The Organic Foods Production Act of 1990 (OFPA) was the result. The NOP Final Rule is the third complete draft published by the USDA. The USDA received significant public comment about both previous drafts, especially the first Proposed Rule issued in December 1997.

Organic standards grew more similar in the time between the passage of OFPA and the adoption of the final rule in December 2000. In the early 1990s producers and certifiers cooperated to found the Organic Certifiers Council (OCC) of the Organic Trade Association (OTA). Another joint venture was the Organic Materials Review Institute (OMRI), which conducts research on the organic acceptability of materials used in production. These and other initiatives facilitated mutual recognition among organic certifiers and brought different certifiers' standards much closer to one another. In addition, efforts to write an industry consensus standard continued. The American Organic Standards (AOS), completed under the auspices of OTA in October 1999, are the latest such standards.

2.1 The regulatory situation during the 1990s

During the 1990s, government regulation of organic certification and labeling consisted mainly of a patchwork of state laws. The OFPA outlined some requirements for organic production but those requirements were essentially not enforced. By the late 1990s, 17 states required certification for products to be labeled organic (OTA, 1996). Thirteen additional states did not require third-party certification and inspection but did have some regulation, ranging from a single sentence to very complete production standards. Of these 13, at least two required registration with the state department of agriculture as well as adherence to specific production standards. Twenty states did not regulate the term 'organic' on food products.

Because of the patchwork nature of state laws, third-party certification was the most important guarantee of organic production in the market. Even though only 17 states required certification to use the term 'organic', producers could choose to be certified for other reasons. For instance, processors and farmers who sold products to regional or national markets might have found it cost-effective to follow the labeling laws of the strictest state in which they sold, rather than selling certified product in one state and uncertified product in another.

A study of producers in California (Tourte and Klonsky, 1998) provides some evidence of the proportion of organic farms that were certified. From 1992 to 1995, certified organic farms represented less than half of all registered organic farms in California but accounted for about 80% of organic hectarage and about 90% of sales of organic products. These figures probably exceed the national average: since all California producers using 'organic' had to register with the state and submit certain documents, the additional cost of certification for them (considering financial as well as management and record- keeping costs) was likely to be less than in other states. However, it is likely that in the US overall, at least the majority of food and fiber sold as 'organic' was certified, and the figure may have been as high as 75±80%.

A distinguishing feature of organic certification is that it concerns primarily the complex processes of production, rather than the product itself. The diversity of production processes, along with the detailed and complex standards for organic production, meant that organic certifiers rarely enforced their written standards exactly and without exceptions. A survey of 17 organic certifiers suggests that many organic producers, processors, and handlers are 'identified as having some deficiency, yet retain their certification status each year . . . because that is the nature of organic agriculture, a constantly improving system and standard' (OCC, 1998). In the 1990s, standards became more harmonized and generally stricter (J. Gillan, New England Small Farms Institute, Belchertown, Massachusetts, personal communication, April 1998). However, some certifiers may not have been enforcing their strict standards.

Another important aspect of certifier behavior is that organic certifiers may believe that the reputation of the entire industry depends on how consumers perceive their integrity as a group. For instance, a highly publicized fraud case in 1994±1997 was generally seen as damaging to the organic industry as a whole, not just to the certifier involved (Kindberg, 1997; Mergentime, 1997). As a result, certifiers could be reluctant to publicly report wrongdoing by another certifier, if they believe that doing so might affect the overall reputation of organic products (IOIA, 1998). Accreditation, the process of making sure that certifiers enforce their standards and run effective programs, provides an additional check on how certifiers operate. In 2000, seven US organic certifiers were accredited by one or more accreditation agencies (AMS, 2000a; IFOAM, 2000). Prior to implementation of the national rule, the main benefit of accreditation was access to export markets.

2.2 Structural Differences Between the Old and New Systems of Regulation

The key structural differences between the old and new regulation systems are shown in Table 1. The old system featured many different certifiers, each with its own standards and program management guidelines. Accreditation of certifiers was optional. Individual certifiers had complete authority over decisions of certification and decertification, recognition of other certifiers, and revisions of standards.

The regulatory system under the National Organic Program (NOP), like the old system, is carried out by many different certification organizations. However, most certifiers use the national standard for organic production, with two exceptions. Certification programs operated by state Departments of Agriculture have the right to enforce standards higher than the federal standard. Also, both private and state agencies may enforce higher standards if contract specifications require production to higher organic standards (e.g., for export). USDA or its agent accredits all certifiers. Certifiers will likely be permitted to certify 'on conditions'; that is, to certify operators that do not fully comply with the written standards if they can show reasonable cause. The ultimate authority for revising the federal standards lies with USDA. Individual certifiers have the authority to certify applicants and deny certification in the event of a violation, but the Secretary of Agriculture (or the state organic program administrator) will hear any appeals from operations denied certification. All US certifiers are required to recognize each other's certification.

3. Comparison of Organic Certification Programs

The central difference between the old and new regulatory systems is a move from many standards to essentially one standard for organic production and labeling. To assess the likely market impacts of this change, we first present

a detailed description of the standards, certification program management, and labeling guidelines in place in the late 1990s. We compare 18 state and private certification programs and analyze differences in their standards and programs. We also present a parallel comparison of three certification programs designed for national or international use: the 1998 IFOAM Basic Standards, the 1999 American Organic Standards, and the USDA's National Organic Program Final Rule (AMS, 2000b). We did not incorporate material from the Program Manual, a document that is currently being written and which will be finished by the time the Final Rule is fully implemented (currently scheduled to be October 2002). The Program Manual will serve as guidance for certifiers regarding implementation of the NOP standards (AMS 2000b, p. 38).

We compared several directories of organic certifiers and identified over 50 certifiers operating in the US in 1998. Of these, we chose 18 for the comparison of standards (Table 2). Because of the complexity and detail of organic certification standards, using a sample was necessary in order to set up a comprehensive comparison. We chose our sample to represent the diversity of certification programs in terms of geographic location, extent of geographic coverage, and for-profit or non-profit status. In addition, we chose our sample to include the majority of certified organic sales in the late 1990s. Included in the sample are six programs operated by State Departments of Agriculture, six large, private programs, and six smaller private programs. In all, these 18 programs certified over 3000 farms, according to the Organic Farming Research Foundation (OFRF, 1998), of the approximately 5000 certified farms in the US. We called the selected programs and asked for their current (1998) certification standards and administrative procedures. Nearly all certifiers were called between April and June 1998.

Nine of the 12 private programs are not-for-profit operations. Seven of the 12 private programs had some organizational link to a group that advocates for, or educates people about, organic foods. Eight certifiers, including all six of the large private programs, certify operations outside the US. All six state-run programs, and two of the smaller private programs, certify operations in only one state. Accreditation was fairly common among the larger certifiers; one or more third parties accredited five of the six largest programs. Only one of the six small certifiers was accredited. Although none of the state-run certifiers were accredited by a third party, for each there was some degree of state government oversight of their operations. While all certifiers had procedures for recognizing other programs' certification, only some had standing agreements with other certifiers by which mutual recognition was more automatic.

3.1 Organization of the comparison

In designing our analysis, we found no prior frameworks for comprehensively comparing US organic programs. We did find two previous international comparisons (Lavender, 1998; Riddle and Ford, 1997) that provided some guidance. In addition, we drew ideas from the issues cited by producers, consumers, and certifiers who commented on the two drafts of the USDA NOP Rule. We also asked members of the organic industry and organic certification programs about major differences they perceived. In the end, our list of issues to compare came primarily from extensive work with the standards themselves.

We included over 200 specific criteria in the final comparison (Table 3). Due to space constraints we are unable to present the complete results here; interested readers can find the full comparison at <http://www.umass.edu/resec/organicstandards>.

4. Results

4.1 Principles and general goals of organic production

For all the certifiers in our comparison, the primary tool of organic certification was the organic management plan. The organic plan generally includes aspects of design and record keeping for the operation. For a farm, design components might include: (1) the history of the land; (2) maps indicating surrounding land uses, prevailing wind direction, soil types, water sources, and topographical features; (3) a farm equipment inventory; (4) plans for cropping practices; and (5) anticipated improvements. Record-keeping criteria for a farm might include: (1) soil, water, and crop tests; (2) records of management practices and materials used; and (3) documentation of yields. Similarly, an organic plan for a processing or handling operation would entail aspects of facility design, the management system, and record keeping. The organic plan is a key tool of certification because it allows producers and certifiers to communicate intended practices and still be flexible about those actually used.

Many of the organic standards include a list of the principles or purposes of organic production. Almost all programs (16 of 18) included some expression of environmental goals in their definition of organic production, such as improving soil quality or minimizing environmental pollution from agriculture. Twelve programs also stressed the importance of providing nutritious or high-quality food. These were the two most common goals but we identified many more areas where one or more certifiers set out additional goals of organic production. Six programs also stated or implied that organic production should aim to maintain the integrity of food during processing or supply foods with minimal processing. Eight programs said that organic systems should provide a safe and healthful environment for farm workers and other laborers. Three programs said that an important goal of organic production is to promote a regionally organized agricultural system by encouraging local sales.

We draw two main conclusions. First, it is clear that many certifiers believe organic production involves more than production practices. Secondly, there are sometimes disparities between the stated goals and the business practices of certification programs. For instance, one of the three certifiers that expressed the goal of promoting a regionally organized agricultural system certified many large, nationally marketed brands of processed and unprocessed organic foods.

Like the majority of programs, the USDA's National Organic Program includes a commitment to improving soil quality and implies that organic production minimizes environmental pollution from agriculture. The NOP also states that organic producers should protect biodiversity on the farm and its surroundings. Overall, the NOP is less ambitious than some programs in stating the goals of organic agriculture but is roughly consistent with many programs in this comparison.

4.2 Regulation of Materials

Although organic management is usually defined as a system that enhances soil health, a key component of organic production is the non-use of certain materials. All the standards we reviewed included a Materials List that showed the materials that were allowed and prohibited in organic production. There were fundamental similarities in the way certifiers constructed their Materials Lists: programs used similar criteria and frequently made identical decisions about organic acceptability. However, there were some disagreements about the acceptable use of specific materials. There were also some differences in the way programs restricted the use of certain materials. The main criterion for the organic acceptability of materials is that natural materials are allowed and synthetic materials are prohibited. However, there were exceptions on both sides. Certifiers also judged materials by their environmental impact, the rate of decomposition in the soil, the source of the material, the possibility that it was contaminated (for instance, mined minerals that may contain harmful impurities), and the availability of alternative materials or practices to accomplish the same end. Different programs weighed these criteria differently. For example, there was some dispute about whether mined sodium nitrate should be permitted as a fertilizer because, although it is highly soluble and contributes to soil salinization, it is a useful source of nitrogen in cold weather and is important for many organic growers. As of 1998, 5 of the 18 programs prohibited the use of sodium nitrate and 11 more allowed it with restrictions; two programs allowed it to be used with no restrictions. We tracked certifiers' judgments for 13 specific crop-production materials; we found significant differences in the regulations pertaining to six of these materials. The National Organic Program is consistent with most organic certifiers. Where there are differences in regulations, the NOP tends to prohibit more of the materials we tracked than did other programs. There was also some disagreement about the relative importance of materials regulations. As stated earlier, organic production is often defined as a system that enhances soil health, but another definition is a system that avoids certain materials. Different programs emphasized one concept or the other, which resulted in a different focus in the standards. Programs that emphasized the former concept (the 'ecology-based' or 'plan-based' approach) might require the producer to submit an organic plan focusing on practices that build soil quality, while those that emphasized the latter ('materials-based' or 'list-based') might focus more on lists of allowed and prohibited materials. Fifteen years ago, some organic certifiers placed more emphasis on such list-based certification (J. Gillan, New England Small Farms Institute, Belchertown, Massachusetts, personal communication, April 1998) but we found 15 of 18 certifiers, including the largest programs, stressed a plan-based approach. The National Organic Program similarly uses a plan-based approach.

We also found that certifiers frequently regulated materials in similar ways. As noted above, an industry-based survey of 17 organic certifiers (OCC, 1998) suggested that some certifiers view organic agriculture as a 'constantly improving system and standard' rather than a set of absolute guidelines. We found one expression of this concept in

certifiers' guidelines for materials. Seven certifiers included in their Materials List a category for 'regulated' or 'restricted' substances, and stated that the producer must reduce the use of these restricted materials over time (some programs had the 'restricted' category but did not force producers to reduce their use). This is how some certifiers encouraged producers to make continuing improvements in their management systems. The National Organic Program does not use this type of approach.

4.3 Organic Crop Management

Crop management requirements were broadly similar across certifiers. All programs required producers to submit an organic plan annually; most used it as the primary tool of certification. Programs required the same type of information in the plan, such as land history and neighboring land uses. Fourteen programs required producers to use crop rotations for annual plants, though they varied in how they prescribed these rotations: some programs suggested permissible rotations, while others only said that some rotation is required. All the programs compared required a 3-year transition period between the last application of a prohibited material and the harvest of the first certified organic crop. Twelve of the 18 programs allowed producers to sell their products in the intervening time with labels such as 'certified transitional organic' or 'certified transitional'. All 18 programs allowed farms to operate organic and conventional fields in the same farm if they met additional organizational requirements. However, seven programs said they required or encouraged eventual conversion of the whole farm to organic methods. The facet of crop production where there was most disagreement concerned unintentional contamination of organic crops by prohibited materials. Programs varied significantly in approaches to prevention, detection, and remedies. Approaches to prevention were most similar. Fifteen of the 18 programs required organic fields to have a buffer zone on borders they shared with land where prohibited materials may be a concern, such as roadways or conventional farmland. The buffer zone most often meant simply a separation in space, usually a 7.6- or 15.2-m (25- or 50-foot)-wide strip of land; some certifiers also required physical barriers or means to divert potentially contaminated runoff (certified farmers could grow crops in buffer zones but the products could not be labeled as certified organic). Another possible avenue of contamination is from irrigation water, but only six certifiers (including just three of the six large private programs) always required producers to test irrigation water for prohibited materials. Since all certifiers required producers to document the source of irrigation water and presumably could require tests if warranted it is difficult to tell how often certifiers acted with regard to contaminants in irrigation water. However, the fact that only six programs mentioned the issue indicates that some certifiers might not have considered it at all.

In general, the standards indicate that certifiers acted somewhat aggressively to encourage farmers to prevent contamination by drift or runoff. Testing for contamination seemed to occur less frequently. Only six certifiers tested crops regularly for residues of prohibited pesticides or fertilizers. This paucity of regular testing was probably partly due to the expense involved; indeed, four of the six certifiers that tested regularly were state-run programs that more likely had the resources to subsidize testing. The lack of regular testing may also stem from the understanding that organic certification is the certification of a process (i.e., how the product is grown or produced) rather than the product itself. However, all 18 programs reserved the right to test crops if they suspected residues, and almost all programs had fixed limits for synthetic residues that organic products could not exceed.

If the certifier concluded that contamination was caused by a farmer using prohibited materials (i.e., it was 'intentional'), then the farm was decertified and legal action might be taken. Where contamination was unintentional, the crop and/or land might be decertified, depending on the source and level of contamination and the certifier. If the contamination was from drift, five certifiers in our comparison automatically decertified affected crops, regardless of the level of drift or residue. Three of these five also decertified the land on which the crops were growing, though it is unclear whether the land would need to pass through the 3-year transition time again before the next organic crop could be harvested. Most certifiers did not automatically decertify but did require residue testing.

Fourteen certifiers stated that produce with residues of prohibited materials (such as synthetic pesticides) above a certain level could not be certified organic. This level varied among certifiers: 10 programs set the level at 5% of the US Environmental Protection Agency (EPA) tolerance level of the chemical (or 100% of the Food and Drug Administration (FDA) action level, if there was no EPA rating), while four programs used 10% of the EPA tolerance level. Two more certifiers automatically decertified crops with any detectable level of residue if the contamination

was from drift, but did not set a limit on residues if the contamination was from historically contaminated soil (such as one might find in an old, converted apple orchard).

The National Organic Program standards for crop production are consistent with those of the certifiers in this comparison and are not particularly more or less strict. The NOP requires producers to submit an organic plan, including plans for crop rotation. It requires the same 3-year soil transition time, though it does not permit 'transitional organic' labeling. Like the majority of certifiers, the NOP does not require regular residue testing of produce or soil, but it does require preventative measures such as buffer zones and runoff diversion. In the event of unintentional contamination or drift, the NOP requires crops to be tested for residues but does not require soil tests again, like the majority of certifiers. Finally, the NOP is in line with certifiers in this comparison with respect to allowable levels of prohibited substances. The NOP does not permit produce to be sold as organic if it contains residues that exceed the FDA action level or 5% of the EPA tolerance. Like two programs in our comparison, it does allow exceptions if soil is historically contaminated, although the Final Rule includes no firm guidelines on what level might be permitted from such background contamination.

4.4 Organic livestock production

The philosophy of organic livestock production is to maximize the health of livestock animals while avoiding the use of synthetic materials. In addition, consumers may expect organic livestock products to contain fewer residues of synthetic animal drugs and may expect organic animals to be treated more humanely. Thirteen of the 18 standards we compared involved standards for organic livestock production, including two state programs, all six large private programs, and five small private programs. We identified five main sections in livestock standards: guidelines for sources and conversion times for organic animals; housing; feed requirements; healthcare; and methods of enforcement and record keeping. Programs frequently had different guidelines for poultry, dairy mammals, and slaughter mammals, so we discuss these separately. Until March 1999 the USDA's Food Safety and Inspection Service prohibited organic labeling on meat products. This prohibition was lifted when the USDA announced that the Meat and Crops Grading Branch of the Agricultural Marketing Service would serve as an accreditor for organic certifiers wishing to certify organic meat (FSIS, 1999). Nevertheless, as of 1998 all 13 organic certifiers in this survey that had standards for any livestock products also had standards for organic meat production. Organic certifiers had been developing meat certification guidelines for several years despite the federal prohibition on organic meat labeling.

Most of the certifiers in our survey (8 of 13) required that slaughter mammals be in organic management from birth in order for the meat to be labeled certified organic. The other certifiers allowed slaughter mammals to be converted to organic production at any age, and almost all required a 1-year conversion period. That is, these programs required slaughter mammals to be kept in organic management for 1 year before their meat could be sold as 'certified organic'. For dairy animals, the standard time required to convert animals to organic production was 1 year. Ten of the 13 programs required a full year of 100% organic feed, and seven programs required a full year of organic healthcare practices, before dairy products could be labeled certified organic. Other certifiers required shorter conversion times for dairy animals, ranging from 3 to 9 months for feed requirements and from 1 to 9 months for healthcare. In the case of poultry for meat (broilers), all 13 programs required birds to be in organic management from at least the second day of life. Seven of the 13 programs (including five of six large private programs) required egg birds (layers) to be in organic management from at least their second day in order for the eggs to be certified. The other six programs allowed layers to be converted to organic production after a conversion period ranging from 30 days to 6 months. In comparison, the National Organic Program requires slaughter mammals to be raised organically from birth, dairy animals to be raised organically for 1 year, and broilers and layers to be raised organically from the second day of life, in order for the meat or other products to be certified organic. The NOP, like 7 of the 13 certifiers in our survey, has an exception for 'whole-herd conversion', which allows a one-time, partial relaxation of organic feed requirements when an entire herd of dairy animals is converted to organic production.

In livestock housing systems, certifiers generally required that organic animals be given appropriate housing to maximize their health. A common requirement was that housing should allow 'natural light, fresh air and comfort behaviors suitable to the species and stage of production', but how certifiers applied this requirement is unclear. For instance, it seems to leave open the question of whether animals must have routine access to indoor or outdoor

exercise areas and to pasture. Because of this ambiguity, we compared whether certifiers explicitly state these requirements.

For slaughter and dairy mammals, 11 of 13 programs required access to indoor or outdoor exercise areas (weather permitting). Six programs required that slaughter and dairy mammals have daily access to outdoor areas, weather permitting; three programs explicitly required that this outdoor access include green pasture. Some certifiers also had requirements for what type of confinement was permitted. Two certifiers required that animals be given free access to a non-cement floor when they are indoors for long periods of time. Nine certifiers explicitly prohibited routine or extended indoor confinement, while 11 explicitly prohibited confinement for the duration of the animal's life.

For poultry, 8 of 13 programs required that birds be given routine access to outdoor areas when weather permits. Only one program required that birds have routine access to green pasture. (No programs required that poultry have daily access to the outdoors when weather permits.) Some programs had special guidelines for confinement: for instance, eight programs explicitly prohibited housing birds in fixed cages indoors. Four programs explicitly prohibited lifetime confinement indoors, while two explicitly allowed lifetime confinement indoors as long as the birds were not confined in cages. It was somewhat common for programs to set a requirement of a minimum amount of floor space per bird; seven programs set such requirements.

Overall, there was significant divergence in standards for livestock housing. The National Organic Program tends toward the strict side of the spectrum in some respects, and toward the less strict side in others. For slaughter and dairy mammals, it prohibits routine confinement and requires access (but not daily) to the outdoors, weather permitting, and to green pasture. For poultry, the NOP again requires routine but not daily access to outdoor areas and prohibits lifetime confinement. Like the majority of programs in this comparison, the NOP prohibits the use of indoor, fixed cages to house poultry.

There was more consistency among certifiers with respect to feed requirements. Twelve of the 13 programs required that 100% of the feed given to organic animals be certified organic; one program moved to 100% in its 1999 standards. Nine programs had special provisions for producers to follow when a 'feed emergency' made certified organic feed unavailable in sufficient quantity. In this event, the certifier could grant the producer permission to use certified transitional-organic feed, feed that was organic but not certified, or as a last resort conventional feed. Six of these nine certifiers had some method of limiting the amount of emergency non-certified feed that could be given, either a time limit on how long a producer could claim a feed emergency or a limit on the annual percentage of feed that could be allowed as emergency feed. One certifier required producers to note on product labels if non-certified-organic feed had been given as a result of a feed emergency. The National Organic Program requires livestock to be fed 100% certified organic feed and suggests that organic grain is available in sufficient quantity that emergency provisions are not necessary (AMS, 2000b). It does allow the administrator of the Agricultural Marketing Service to approve temporary variances.

Another aspect of feed requirements is the allowed proportion of concentrates (high nutrient feeds) to roughage (low-nutrient feeds). This is a concern for organic certifiers because of evidence that excessive concentrates can diminish animal health (Macey, 2000). In our survey, just 2 of 13 programs had quantitative limits on the proportion of dry matter intake that could come from concentrates. Three more programs required producers to offer roughage as a free-choice food or prohibited a 'hot' dairy or poultry ration with excessive concentrates. The fact that only 6 of the 13 programs (including just three of the six large private certifiers) limited high-concentrate feeding may indicate that this was an issue that certifiers dealt with more in terms of overall animal health, preferring to avoid being overly prescriptive in written standards for feed. Another possibility is that livestock standards were relatively undeveloped in this area in the late 1990s. In comparison, the NOP addresses the issue of concentrate use only through its requirement that some types of animals be given access to pasture; it has no other stipulations about avoiding excessive concentrates. Although the NOP is in the process of developing more detailed guidelines for managing ruminant production operations, it is unclear whether these will address the issue of concentrate-roughage balance in feed.

Programs also had largely similar healthcare requirements. All the programs in this study stated that preventative care should be the first line of defense against disease. Eleven stated that withholding treatment from a sick animal was grounds for decertification. This is generally an issue when an animal has a malady that cannot be adequately treated by organic-approved methods, so that producers must use remedies that are ordinarily prohibited.

If prohibited remedies were used, producers were required to withdraw the affected animal from organic production temporarily or permanently. However, the required withdrawal time varied by certifier. Withdrawal periods were generally specified as the greater of two durations: a multiple of the time required by the FDA for the specific medication or an absolute amount of time. For slaughter animals, nine certifiers required permanent withdrawal from organic production if animals had been treated internally with a prohibited antibiotic. The four certifiers who allowed meat animals back into organic production following such use specified withdrawal periods ranging from 30 days (or twice the FDA requirement) to 1 year-a fairly large range. For dairy animals, 3 of the 13 certifiers did not allow animals to be brought back into organic production at all if the producer administered a prohibited antibiotic. Withdrawal times for the other 10 certifiers ranged from 12 days (or twice the required FDA withdrawal time) to 1 year. A similar range of requirements applied to application of prohibited parasiticides. All programs prohibited the routine use of subtherapeutic doses of antibiotics, a practice used in conventional livestock operations to promote weight gain, prevent disease, or both (Food Marketing Institute, 2000).

As was the case with conversion times, housing, and feed, the National Organic Program tends toward the strict end of the spectrum of certifiers studied, but is not the strictest. Like most certifiers, the NOP states that preventative care is the first line of defense against disease, and that the failure to treat sick animals may lead to decertification. If synthetic antibiotics or parasiticides must be used, the NOP requires that slaughter animals be removed from organic production permanently and that dairy animals be removed from organic production for 90 days. However, the NOP does not currently allow any synthetic antibiotics under the National List.

4.5 Organic Processing and Handling

In processing, organic certification refers to the way the ingredients of a processed food are produced, as well as the processing facility and methods. Processing includes cooking, drying, mixing, fermenting, freezing, or other manufacturing that alters the flavor, keeping quality, or any other property of the food. Food and fiber handling is the process by which food is stored, shipped, packed, repacked, brokered, or otherwise transferred in its travel between the producer and the consumer. (Technically food processing is a subset of handling, but we use the term 'handling' to indicate handling other than processing.) When a processor or handler applies for organic certification, the certifier is generally concerned with three aspects: dilution of the final product with non-certified ingredients; contamination with toxins, residues or prohibited additives; or degradation of the food 'by allowing the integrity of the food to be altered by the manufacturing process' (OFPANA, 1992). Applicants must demonstrate that they have adequate physical facilities, employee training, management abilities, and record-keeping systems. Sixteen of the 18 programs we surveyed had standards for organic processors and seven had detailed standards for organic handlers. Most programs set up a three-way classification for processed foods that was directly related to product labeling. Products with the highest percentage-often 95±100% organic ingredients-could be labeled as 'certified organic [product]' on the principal display panel (PDP), for example, 'certified organic cereal'. A second category allowed products with a high percentage of organic ingredients to be labeled 'made with organic [list of ingredients]' on the PDP, such as 'cereal made with organic wheat and raisins'. Most certifiers allowed a third category of labeling for products with a smaller percentage of organic ingredients. In this case certifiers usually did not permit a reference on the PDP to the organic content, but did allow a less prominent label claim, such as identifying on the ingredient list which ingredients were certified organically produced. Some certifiers also permitted additional claims on the side panel, separate from the ingredient listing; for example a producer might include a paragraph explaining that the cereal contains certified organic dates and raisins. Where products bear only one label, certifiers equate the most visible part of the label with the PDP and the side parts of the label with the side panels.

Some differences among certifiers arose in the guidelines for product composition for each labeling category. We tracked the following types of product composition guide- lines: the percentage of organic ingredients required for each category, regulations on non-organic and non-agricultural ingredients, and preservation of nutritional quality in processing. We refer to the three labeling categories outlined in the preceding paragraph as 'organic', 'made with organic', and 'contains organic ingredients'. Depending on the certifier, these categories corresponded to somewhat different proportions of organic ingredients. All but one certifier required products to contain 95±100% organic ingredients in order to be labeled 'organic'; the remaining certifier allowed such labeling for products with 90±100% organic ingredients. Six certifiers required products to contain 50±95% organic ingredients in order to be labeled as 'made with organic ingredients' on the PDP, while three certifiers required 70±95% organic ingredients and the

remaining seven had no guidelines for this category. Of the nine certifiers with guidelines for the 'made with organic' label, all allowed products with some organic ingredients but less than the minimum (50% or 70%) to be labeled as 'containing organic ingredients' on the side panel. However, one of these nine certifiers did not permit the use of its name on the label, even if it certified the ingredients.

Most certifiers encouraged producers to use as many organic ingredients as possible in a product; 11 of the 16 certifiers required processors to use organic ingredients when they were available, including using more organic ingredients over time as they become more available. Certifiers regulated fairly strictly the ingredients in products labeled 'organic' and 'made with organic': all of the programs with specific guidelines for these categories had at least moderately detailed lists of permitted ingredients and stated or implied that ingredients not on these lists were prohibited. We did not make side-by-side comparisons for most ingredients but all 16 certifiers prohibited the use of irradiated ingredients in processed foods labeled 'organic', and all but one prohibited the use of ingredients made with genetically engineered organisms (GEO). Ingredient guidelines were somewhat less restrictive for foods labeled as 'containing organic ingredients' on the side panel. Of the nine programs with detailed guidelines for foods in this category, four suggested that processors were allowed to use any ingredient in these foods, except-for two of the four certifiers-ingredients that were irradiated or made with GEO.

In addition to ingredient guidelines, organic certifiers required applicants for processing certification to meet guidelines for storage, transportation, record keeping, and other aspects of facility management. Fifteen of the 16 certifiers with processing standards required processors to follow the same guidelines regardless of whether they handled products in the 'organic', 'made with organic', or 'contains organic ingredients' category. All 16 certifiers allowed certified operations to produce both conventional and organic products, as long as the facility met additional organizational requirements.

Organic certifiers were fairly aware of current trends in food safety and quality assurance: 11, including all of the six large private programs, required producers to include elements of the Hazard Analysis Critical Control Point (HACCP) concept in the organic plan, and one certifier recommended that producers comply with ISO 9000, a comprehensive quality assurance system administered by the International Organization for Standardization. We use two indicators to track how organic certifiers ensured that processed products did not contain prohibited residues. Eleven of the 16 certifiers allowed processors to use prohibited materials to fumigate the areas where organic ingredients or products might be stored or processed, but 10 of these 11 required producers to keep organic products out of fumigated areas for a longer period of time than the fumigant label required. Five programs had provisions for regular residue testing of processed products to check the levels of prohibited materials in the final product. As with crop residue testing, all 16 programs stated they would test products for residues if concern were warranted.

Eleven of the 16 certifiers with processing standards stated that minimizing environmental pollution from agriculture should be a goal of organic production; 6 of these 11 required that organic processors minimize packaging used in certified organic products and two required that organic processors submit a plan for ecological waste management for the facility. Nine certifiers stated in their principles that organic producers should preserve food quality during processing but only two of these emphasized this as a guideline in their processing standards. These apparent inconsistencies may have been due to the relative newness of organic processing standards or to certifiers' desire to avoid being overly prescriptive in the rapidly growing market for processed organic foods.

Seven of the certifiers in our survey, including three of the six large private programs, had detailed guidelines for the certification of organic handlers. All 16 programs with processor standards required processors and handlers to maintain an audit trail of receipts, yield statements, and other documents sufficient to track raw materials from the supplier to the retail market. Of the seven programs with detailed standards for handlers, six stated that when a product or ingredient was transferred from one party to another, both the seller and buyer had to keep a record of the volume of product exchanged. Like the requirement for an audit trail, this tool may have minimized the potential for fraud in organic labeling. None of the seven programs with detailed handler standards (nor any other certifier in our survey) required that farmers or other producers who sell their products to another supplier do so only via a certified organic handler. There were probably two main reasons for this. First, handler certification was (and still is) fairly new, and there were relatively few certified organic handlers (Dimitri and Richman, 2000). Secondly, certifiers were primarily concerned with the production process, rather than with the handling of products after they left the control of the producer.

The processing guidelines of the National Organic Program are generally clearer than those contained in the programs we compared, but overall they are not significantly more or less strict. The NOP has separate labeling guidelines for '100% organic' products; otherwise, the NOP requires 95±100% organic ingredients for the 'organic' product label and 70±95% for the 'made with organic ingredients' claim; when fewer than 70% of the ingredients are certified organic, ingredients may be identified as organic in the ingredient list but additional statements may not be made, except for identifying the percentage of organic ingredients on the side panel (as in the preceding discussion, we refer to products in this category as 'containing organic ingredients', although the NOP does not allow that phrase to be used on these products). Like the majority of certifiers, the NOP encourages processors to use organic ingredients when they are available. A less strict aspect of the NOP is that any ingredient may be used in products in the 'contains organic ingredients' category, even one that is irradiated or made with GEOs. This trait is shared by only two of the certifiers in our comparison. The facility management requirements of the NOP are generally consistent with those of other certifiers, as are the handler guidelines; but NOP's handler standards are much clearer than in most programs we compared.

4.6 Organic Labeling Guidelines

Since most producers and certifiers see organic certification as a marketing tool that communicates to buyers along the supply chain and to consumers, labeling guidelines are one of the most important sections in certification standards. Many certifiers required producers to include certain statements on labels; most certifiers also prohibited certain phrases on labels. In addition, ten certifiers in our survey required producers to submit their product labels for approval before the product could be sold. At least four of the certifiers who required pre-approval of labels certified 50 or more processors; thus this requirement was not only used by small certifiers but large ones as well. For unprocessed foods we focused on two issues: transitional labeling and labeling of non-retail containers. Twelve of the

18 certifiers allowed products to be labeled 'transitional organic', 'certified transitional', or some variant if the product met all requirements for certification except the 3±year transition time. Transitional labeling may make the transition to organic production less expensive, since consumers may be willing to pay a premium for 'certified transitional organic' products (though not as high as the premium for 'certified organic'). However, it may lead to confusion in the marketplace, if consumers do not understand the difference between the labels. Three of the certifiers in our survey addressed this issue by prohibiting the word 'organic' in the label claim for transitional product. In addition, only one certifier allowed 'certified transitional organic' product to carry the same logo as 'certified organic' product. In comparison, the National Organic Program does not allow transitional-organic certification, concluding that 'it is unclear what marketplace value such a label might have, and we are concerned that allowing such a label at this point might lead to greater consumer confusion rather than providing clarity' (AMS, 2000b).

Labeling of non-retail containers may help to guarantee the integrity of organic products through the handling chain. Ten of the 18 certifiers required products to be identified as 'organic' on the invoice or the container; seven of these also required the name of the certifier to appear on the invoice or the container. The National Organic Program does not require non-retail labeling; perhaps because the NOP staff feels that mandatory certification of handlers will provide the same guarantee of organic integrity through the handling chain.

We discuss label requirements for multi-ingredient processed foods in the context of the three labeling categories presented earlier. For each category, we compared guidelines for the use of the certifier's name and logo on the principal display panel (PDP) or elsewhere on the label, in addition to guidelines for identifying organic certification in the ingredient list and indicating the percentage of organic ingredients (Table 4). There was substantial agreement about where certifier names and logos were allowed, except for products labeled 'made with organic ingredients'. Certifiers were split on the questions of mandatory identification of organic ingredients in the ingredient list and whether the percent of organic ingredients should be indicated on the label.

The National Organic Program would allow 'organic' products to use both the USDA organic logo and the certifier name and logo on the PDP. Products in the 'made with organic' category could use the certifier logo anywhere on the label but could not use the USDA organic logo at all, and products in the 'contains organic ingredients' category could not use the certifier logo or the USDA logo anywhere on the label. The NOP effectively summarizes the labeling requirements that existed among US certifiers, at least as expressed in this survey. The NOP requires individual ingredient identification in the first two labeling categories (unless the product is 100% organic)

but considers it optional for the last (although if products in the third category do not have individual ingredient identification, then the word 'organic' will not appear on the label at all). The NOP makes percentage labeling optional in all categories.

4.7 Certification Program Management

The quality or stringency of standards is meaningless unless standards are applied and administered effectively. Therefore, we also compared certifiers' administrative guidelines. We had difficulty obtaining some certifiers' policies because they were reluctant to release them or they used unwritten policies on some issues. It was also difficult to evaluate how strictly certifiers followed their written policies. In at least one publicized case, organic labeling fraud occurred despite the certifier's written conflict of interest policy because not all personnel followed the policy (Mergentime, 1997). We compared aspects of policies related to the confidentiality of applicants, conflicts of interest, unannounced inspections, decertification, and appeals. Confidentiality and conflict of interest policies were nearly universal. Fifteen of the 18 certifiers had written policies that forbade certification personnel to disclose certain kinds of information about certified operators; two more certifiers had unwritten policies to this effect. Twelve of the 18 programs had a written policy that prohibited inspectors and decision makers (such as certification committee members) from having financial interactions with certified applicants within 1 year before or 1 year after a certification decision. Four more said they had an unwritten policy to the same effect. Another concern for the integrity of organic certification claims is whether producers represent their operations accurately; one way certifiers can check is to perform an unannounced inspection of some or all applicants. (All the certifiers in our survey inspected operations at least once per year, but this inspection was scheduled in advance.) Eight programs, including five of the six large private certifiers, said they perform unannounced inspections of applicants regularly, either at random or for operations where the certifier felt there was reason for concern. One program also performed an unannounced second inspection on all first-time applicants. All of the programs reserved the right to make unannounced inspections at any time, and all said they would investigate any allegations that a certified producer had violated a certification requirement. However, one certifier gave operators 24-hour notice before all inspections, even 'unannounced' inspections. If an inspection or some other event resulted in the decision to decertify an operation, all the certifiers in our survey had a process by which operators could appeal the decision.

The National Organic Program requires certifiers to have written policies to prevent financial conflicts of interest between producers and inspectors or decision makers, by banning financial interactions for 1 year before and 1 year after the certification decision. The NOP also requires certifiers to have a confidentiality policy adequate to protect certified operators. It does not require certifiers to perform unannounced inspections on any operations, unless they see reason to do so. A feature of the NOP that sets it apart from the certifiers in our survey is that, in order to prevent conflicts of interest, it prohibits certifiers from giving advice to applicants and certified operations about how to overcome identified barriers to certification. Although we did not compare this aspect specifically, our understanding is that in the old system many certifiers did offer advice during the certification process about overcoming identified barriers.

4.8 Comparing the 18 Programs to Three National and International Programs

We included three additional programs in our survey: the American Organic Standards and the National Organic Program, both of which were written as standards with which all certifiers would comply; and the Basic Standards of the International Federation of Organic Agriculture Movements (IFOAM), a major European organic organization. IFOAM is important in the US because several US certifiers are accredited by an organization affiliated with IFOAM. The Organic Trade Association's American Organic Standards (AOS) are intended to represent an industry-based consensus of US standards. They were written in part as a baseline with which OTA members (including most US certifiers) must comply. Compared to most of the 18 US programs analyzed, IFOAM's Basic Standards are generally broader-reaching in describing the goals of organic production, often but not always more lenient about specific guidelines, and more stringent in requirements for administrative procedures. For instance, IFOAM standards require operations with parallel organic and conventional growing systems to convert eventually to full organic production, require environmental practices such as water conservation and minimization of packaging for processed products, and suggest that livestock animals should be fed from feed produced on the farm. On the other hand, IFOAM requires only a 12- or 18-month transition time for soil for crop production, does not impose an absolute limit on residues of

prohibited materials in products, and has shorter conversion times for animals brought into organic production. In part, these less exacting requirements reflect the fact that these are 'basic standards', allowing country-to-country differences in keeping with what IFOAM views as the site-specific nature of organic farming. In general, IFOAM's more flexible standards probably allow a larger set of producers to meet organic requirements. Since many certifiers see organic production as a continually improving system, IFOAM's approach might be viewed as equally valid when compared to the standards of most US certifiers.

The American Organic Standards are generally far-reaching in their goals and exacting in their specific requirements. The AOS are generally at least as strict as the standards in this comparison; in some aspects they are more strict than most. For instance, the AOS requires livestock producers to give slaughter and dairy animals daily access to pasture, a requirement shared by only three of the certifiers in our comparison. The AOS also requires a longer than usual withdrawal time after dairy animals receive an internal antibiotic and would require that, by 2003, if an antibiotic must be used then the animal must be permanently removed from organic production. Other than these and a few other cases where the AOS are stricter than most standards, the AOS differ primarily in that they contain more thorough explanations and descriptions.

Overall, the National Organic Program tends toward the stricter end of the spectrum of certifiers compared here. Most elements of crop production standards are similar to the 18 certifiers compared, as are most requirements for livestock conversion, housing and pasture, feed, and healthcare. The NOP guidelines on product composition for multi-ingredient processed foods, and on handler certification, are clearer and more detailed than those of many certifiers. The NOP provisions on labeling are also consistent with those of most certifiers. In some places the NOP is significantly stricter than most standards in the old system, as is the case in its provisions prohibiting certifiers from giving advice about overcoming identified barriers to certification. The main aspect we identified where the NOP is significantly less stringent is that it describes a more limited version of the goals of organic production than many certifiers in this survey. The NOP's provisions for some aspects, such as livestock pasture, may not be consistent with some consumers' beliefs about what organic production is or should be, but do appear to be generally consistent with the spectrum of standards compared here.

4.9 How diverse was the organic certification system in the 1990s?

Our detailed comparison suggests that, while there was considerable variation in standards, labeling guidelines, and administrative procedures among the organic certification systems in use during the late 1990s, most of the differences were relatively minor, except in the area of livestock production (Table 5). We believe the observed differences in standards arose from three main sources. First, some certifiers-especially smaller ones-may not have found it worthwhile to write complete standards for approved, regulated, and prohibited practices, preferring instead to deal with situations as they arose. Many certifiers, both large and small, had slow processes for revising standards-whether because of small staffs, limited resources, democratic (but slow) review processes, or a failure to use information technology effectively. For example, many certifiers, including several of the largest, could not give us an exact number for their certified growers, processors, and handlers because they had no computer database of their certified operators. This suggests a second reason for disparities in written standards: with limited resources, certifiers put different priorities on bringing their written standards up to date with current working policies. Finally, some differences in standards reflected actual differences in practice, as certifiers held different beliefs about the defining features of organic production, how diverse goals of organic production should be prioritized, and how those goals should be operationalized. It is also important to remember that differences in standards may have been narrower or wider in practice, based on how they were applied and enforced.

3. Likely Impacts of the National Organic Program on Markets for Organic Products

The US has moved to a new system of certification that features a national standard under the National Organic Program (NOP). Our detailed comparison of the range of organic standards in use in the late 1990s provides a basis to evaluate the likely impacts of this change on several features of markets for organic products.

3.1 Clarity About Standards Among Buyers

The major cost attributed to the old, decentralized certification system was confusion among consumers and in the supply chain about what 'organic' meant. Proponents of a uniform national standard argued that it would facilitate the market for organic products and increase sales. On the whole, we did not find large variations among organic certification programs in terms of the characteristics of the programs that are likely to be important to consumers and other buyers. However, there were some key areas of difference between standards. The single area where certifiers were most different was in livestock standards. For example, most programs in this comparison had limited requirements for the pasturing of livestock animals. If some consumers believe that organic livestock are required to be free ranging, then under some standards they may have been misled about the meaning of organic meat and dairy products. The NOP is generally on the stricter end of the 1990s spectrum of standards, so it may better align standards for organic livestock production with consumer expectations but, as noted above, it may not meet all consumer expectations.

A second major difference was how certifiers treated the issue of pesticide residues in organic foods. Growth in demand for organic foods may be fueled in part by consumers' belief that organic foods contain lower pesticide residues. However, organic production was generally defined as an integrated system of environmentally sustainable production, rather than a system that aims primarily to produce foods with lower pesticide residues. Although our comparison suggests most certifiers prohibit organic labeling of foods with pesticide residues above a certain level, only one-third of the certifiers test for residues regularly. If low pesticide residues are a primary reason that consumers buy organic products, then some consumers may have been misled about the extent this was assured under different organic certification programs. This situation will not change substantially under NOP.

A final difference was in how certifiers set out goals for organic production that were not directly related to food production. While some certifiers suggested goals such as providing a safe environment for farm workers, improving wildlife habitat around the farm, or creating a regionally based food system, others defined organic production exclusively in terms of not using prohibited materials. In addition, certifiers implemented these goals to different degrees. These differences may have been meaningful for some consumers and other buyers.

The National Organic Program may eliminate some confusion in regard to these areas of difference. The new system continues to feature numerous certifiers but the USDA, or its agent, accredits them. Use of the term 'organic' on a product label requires the producer to be certified, except for very small producers. The single, baseline standard and the use of a standardized label are likely to reduce confusion among buyers regarding what it means to be 'organic'. The success of the national standard in supporting the market for organic products will ultimately rest on how well it matches the demands of consumers and other buyers. A uniform standard that requires practices that they view as important (e.g., pasturage requirements for livestock, residue testing of products) will facilitate market growth, while a standard that misses that mark may not.

3.2 Transaction Costs For Certifying Multi-Input Products

A second cost attributed to the decentralized certification system was higher transaction costs for producing products that required certification by more than one certifier. This could occur with multi-input processed products, livestock products where certified organic animals were fed certified organic grain and hay, and products that passed through handlers that were certified by different programs. Because programs differed in standards and management, certifiers often required a document review process before accepting another program's certification of an ingredient or handler. Some certifiers had standing mutual recognition agreements that granted automatic recognition to handlers or producers certified by the other, but the extent of this mutual recognition was limited. The National Organic Program will likely reduce these transaction costs because certifiers are required to recognize each other.

3.3 Costs of Production Under Standards

A third concern about the decentralized certification system was that producers would face different costs to be certified due to differences in fees or in the costs of meeting standards. We found some variation in fees, although differences in services offered may have explained the higher fees of some certifiers. Our comparison showed some variation in standards among certifiers but could not quantify the relative costs of meeting those standards. Our judgment is that the actual impact on producers' costs was likely to have been small for differences in residue testing; moderate for differences in livestock pasturing requirements, handler certification, and the implementation of goals;

and large for differences in conversion and withdrawal periods for livestock and gaps between written and enforced standards. As a whole, differences in costs of production due to different standards may have been significant. With the national standard, such variation in costs should be diminished if certifiers apply the standards uniformly.

The requirement for accreditation of certifiers may serve to narrow or standardize gaps between written and enforced standards among certifiers. Of course, accreditation cannot guarantee that certifiers will enforce their written standards uniformly or with an appropriate level of flexibility, especially if the accreditation system relies heavily on self-reporting by certifiers. To be effective the accreditation agency must have an adequate budget for enforcement and experience with organic certification.

3.4 Flexibility of Standards

A major benefit attributed to the decentralized certification system was flexibility. First was flexibility for variations in growing conditions and the commercial availability of inputs in different parts of the country. We found that the existence and apparent success of national certifiers, with requirements that were both stringent and flexible, suggests that loss of this type of flexibility is not a major issue in regard to the NOP. A second type of flexibility relates to buyers having choice among standards that placed varying emphasis on different goals of organic production. We found that standards sometimes did reflect different interpretations of what organic means, affording choice among standards regarding their emphasis on environmental quality, lower pesticide use, regional food systems, and other goals. Whether consumers and other buyers had sufficient knowledge to make their choices effectively is a separate question that our comparison could not address.

A final type of flexibility attributed to the decentralized system allowed certifiers to respond more rapidly to changing market conditions and to the introduction of new technologies. Our comparison highlights the response of certifiers to two new challenges: the regulation of genetically engineered organisms (GEO) and of handlers. In both cases, the freedom of certifiers to set different standards apparently allowed them to address these issues in a way consistent with the philosophy of organic production. However, the ability to have different standards also allowed some certifiers to not respond to new issues, which could have undermined the overall credibility of organic products. Our discussions with certifiers also suggested that changing standards could be a slow process for some organizations.

An additional benefit attributed to the decentralized certification system was more local control of standards and policies of certifiers. In some respects the decentralized system offered more opportunities for local involvement in standard setting. Smaller and non-profit certifiers may have been somewhat responsive to reasonable comments offered by knowledgeable, locally based consumers and producers, but for-profit and larger certifiers may not have been so responsive. The NOP will allow more uniform opportunities for democratic involvement, but given the number of interested parties and the slow pace of federal rule making, the opportunities may be limited. Thus, participants in the organic market who distrust the federal government or who have other reasons for preferring local control are likely to prefer the decentralized system. In addition, in the old system certifiers may have offered services at lower prices as they pursued social goals important to them.

Finally, the new system may force smaller producers and certifiers out of the organic market. Although the new system allows some exemptions for very small producers, small to moderate sized producers, as well as smaller certifiers, may find that the fees associated with mandatory accreditation and certification, as well as increased costs from record keeping and other requirements, make organic production unprofitable. Although state and federal subsidies may mitigate the impact on smaller producers, the Regulatory Impact Analysis issued with the Final Rule acknowledges that the national standards 'may change the composition of the organic industry . . . resulting in a higher concentration of larger firms' (AMS, 2000b, p. 514).

The national standard will largely eliminate the ability of buyers to choose between different standards for what it means to be organic and for organizations to exercise individual control over that definition or compete through their standards. It remains to be seen how the new system compares to the decentralized system in terms of its ability to effectively update the organic standards to meet new conditions and deal with violations of the standards.

3.5 Conclusions

The organic products market grew rapidly in the 1990s. During that period the USDA was formulating a rule that would replace the decentralized system of regulation of organic certification and labeling with a uniform, national standard. Under the decentralized system in the late 1990s, over 50 certifiers operated in the United States. We

assessed the likely market impacts of the National Organic Program (NOP) by describing the certification system in place prior to its implementation. We compared 18 state and private certification programs, analyzing differences in their standards and labeling. We also compared these programs to three certification programs designed for national or international use, including the NOP.

There were numerous differences in the organic standards in use by certifiers during the late 1990s, but overall we found these differences to be minor. Nevertheless, we found that some of the costs attributed to the decentralized system were probably real. The similarity in standards may not have been evident in the market, given the numerous certification programs in operation and the difficulty of comparing them in detail. This was cause for consumers and other buyers in the supply chain to be concerned about organic integrity, as well as for certifiers to be reluctant to extend recognition to other certifiers.

The possible cost of a national standard is a loss in flexibility and local control. We concluded that there is essentially no change in the way the old and new systems affect certifiers' flexibility for variations in local production conditions. Choice was higher for consumers and other buyers when multiple standards were permitted, although whether information was sufficient to make that choice effective is an open question. Finally, local control has decreased under the new system and some market participants may prefer the old decentralized system.

A uniform national standard may have a significant impact on the market through increasing buyer confidence, facilitating certification of multi-input products, or facilitating exports. However, federal regulation of certification will likely decrease the flexibility of organic certifiers to place differing emphasis on the multiple goals of organic production, and may also decrease the flexibility of organic standards to respond to changing market conditions and the introduction of new technologies. We will have to await experience under the new regulatory system to evaluate how it performs relative to the decentralized system.

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Table 1. Key Differences Between Decentralized System and National Organic Program

Characteristic	Decentralized system	National Organic Program
Requirement for certification	Certification requirement varies by state	Certification is mandatory for producers wishing to use 'organic' label (if producer's volume of organic sales exceeds $5000)
Number of certifiers	Many	Many
Standard for production	Many (varies by certifier)	One standard, unless production contract specifies higher standard; state programs may use higher standards if approved by US Secretary of Agriculture
Oversight of certifiers	Optional accreditation	Mandatory accreditation
Authority to decertify operations	Certifier	Certifier (US Secretary of Agriculture can also initiate decertification)
Authority to hear and decide certification appeals	Certifier	US Secretary of Agriculture or administrator of state program
Authority to revise standards	Certifier	US Secretary of Agriculture, advised by National Organic Standards Board
Authority to recognize other certifiers	Certifier	All US certifiers must recognize one another

Table 2. Organic certification organizations included in comparison.

Acronym	Full name	1998 number farms[1]	1998 number of processors and handlers[2]	Founded	Area covered	Type[2]	Accreditation[3]	Recognition
State-Run Certification Programs								
CDA	Colorado Dept of Agriculture	150	0	1989	CO	S	None	None
IDA	Idaho Department of Agriculture	140	7	1990	ID	S	None	OTCO, WSDA
KDA	Kentucky Department of Agriculture	72	1	1990	KY	S	None	None
MDA	Maryland Dept of Agriculture	57	1	1991	MD	S	None	Other states[4]
TDA	Texas Dept of Agriculture/Texas Certified Organic Program	150	86[5]	1988	TX	S	None	None
WSDA	Washington Dept. of Agriculture/Organic Food Program	370	166	1988	WA	S	USDA	OTCO, CCOF, others[6]
Large, Private Certification Programs								
CCOF	California Certified Organic Farmers	750	90	1973	CA, International[7]	NP	IFOAM, USDA	OTCO, FVO, WSDA
FVO	Farm Verified Organic	150	50	1979	International	FP	IFOAM, USDA	CCOF
OCIA	Organic Crop Improvement Association International	2200[8]	400[9]	1985	International	NP	IFOAM,[9] USDA	FVO
OGBA	Organic Growers and Buyers Association	450	75	1977	International	NP	IFOAM, USDA	FVO, CCOF, OTCO
OTCO	Oregon Tilth Certified Organic	283	NA[10]	1981	OR, International	NP	IFOAM, USDA	CCOF, OCIA, QAI
QAI	Quality Assurance International	312	NA[10]	1989	International	FP	USDA	None
Small, Private Certification Programs								
CFSA	Carolina Farm Stewardship Association	65	0	1987	NC, SC	NP	None	None
FOG	Florida Certified Organic Growers and Consumers	72	25	1989	FL, Costa Rica, Latin Amer.	NP	USDA	None
NOFA-MA	Northeast Organic Farming Association ± MA	63	0	1986	MA	NP	None	Northeast[11]
NOFA-NY	Northeast Organic Farming Association ± NY	180	10	1984	NY	NP	None	Northeast[11]
OEFFA	Ohio Ecological Food and Farm Association	200	4	1983	IN, KY, MI, OH, PA, WV	NP	None	None
SCS	Scientific Certification Systems	8	0	1989	International	FP	None	None

[1] Data are from personal interviews with certifiers. Except where noted, all numbers indicate certified operators within the United States.
[2] Type of certifier (NP, non-profit; FP, for profit; S, state agency).
[3] 'USDA' accreditation was offered beginning in 1999 to help certifiers interested in the European export market. It is not the accreditation that will be required under OFPA; no accreditation under OFPA had happened as of the late 1990s.
[4] Certifier extended recognition to all other state-run organic programs.
[5] Does not include 805 certified retail operations.
[6] Formally recognized about 50±60 organic programs, automatically permitting products certified by them to be used as inputs for WSDA-certified producers.
[7] Certified an operation outside California if the parent company was located in California.
[8] Number of farms and processor/handlers for US and Canada
[9] IFOAM accreditation pending.
[10] Information unavailable or declined to provide information.
[11] The 'Northeast' recognition agreement linked programs in Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, and Vermont. It was suspended in the late 1990s.

Table 3. Criteria for comparison of organic certification programs

Principles and general goals of organic production
Environmental and labor principles
- Improve soil, prevent soil erosion
- Minimize environmental pollution from agriculture
- Protect biodiversity or wildlife habitat around farm
- Compare the farm to an ecosystem
- Provide safe environment for farm laborers

Materials principles
- Avoid using prohibited materials
- Emphasis is on avoiding prohibited materials and practices, rather than on improving soil or other goals
- Reduce off-farm inputs or buy local inputs

Food quality principles
- Provide high-quality food
- Provide safe food
- Certifier acknowledges that organic food isn't residue-free
- Provide nutritious food
- Discourage excessive processing/process minimally

Economic system principles
- Promote regionally organized agricultural or economic system (sell product locally)
- Create 'economically sustainable' agriculture (e.g., 'where producers have an adequate return')

Regulation of materials
Approaches to regulation
- Certifier has a Materials List for generic materials
- Restricts individual materials beyond minimum legal requirements
- Certifier uses the Organic Materials Review Institute (OMRI) list as a source to formulate its materials list
- Certifier emphasizes avoiding prohibited practices/materials, not soil building or other 'positive' goals
- Has categorical restrictions on all 'regulated' materials:
  - Operator must reduce use over time, or use is discouraged
  - Operator must get permission before use
  - Operator must submit separate list to certifier of all regulated/restricted materials used

Materials for crop production
- Raw manure: required interval after use before crop can be harvested
- Fungicide-treated seed is prohibited or regulated
- Non-certified annual seedlings prohibited
- Strychnine prohibited or regulated
- Nicotine prohibited
- Piperonyl butoxide prohibited
- Herbicidal micronutrient doses prohibited
- Sodium (Chilean) nitrate prohibited
- Glossy paper/colored inks prohibited
- Use of GEO/GMO materials prohibited
- Use of GEO/GMO derivatives prohibited
- Biosolids (sewage sludge) prohibited
- Irradiation prohibited

Organic crop management
- Organic plan, transition time, and parallel production
- Organic plan required; plan or update must be submitted annually; on-site inspection at least annually
- Crop rotation required for annual plants
- 36-month transition between application of prohibited material and harvest of certified organic crop
- 'Transitional organic' product labeling is permitted
- Soil nutrient test is required for certification
- Soil residue test is required for certification
- 'Parallel production' is allowed, if additional record keeping/organizational requirements are met
- But whole-farm conversion is encouraged or required
- Must report practices or materials used on non-certified land
- Must use IPM/least-toxic methods on non-certified fields

Rotating fields in and out of organic production (even with full transition time) is prohibited
When irrigating, operator must practice water conservation

(Continues)

Table 3. Criteria for comparison of organic certification programs (Continued)

Unintentional contamination
- Buffer zone requirements (space separation, physical barriers, runoff diversion)
- Operator must test irrigation water regularly for contamination by organically prohibited materials
- Regular residue tests required for soil
- Regular residue tests required for crops
- Allowable residue level for residues in produce
- Crop with residues over allowed limit can never be labeled 'certified organic', regardless of reason
- Consequences of drift of prohibited materials on to certified crops or land, when drift is not due to fault of certified operator
  - Crop cannot be labeled 'organic', regardless of amount of drift
  - Affected land is automatically decertified, regardless of the amount of drift

Organic livestock production
- Sourcing and conversion
- Sourcing animals from same farm preferred
- Slaughter animals:
  - Animals not born into certified organic operation may be converted to certified status
  - Time required under organic feed requirements
  - Time required under organic healthcare requirements
- Dairy animals:
  - Conversion time under organic feed requirements (including non-medicated feed)
  - Conversion time under organic healthcare requirements
  - More lenient conversion period for new herds
  - If replacing many animals at once (after catastrophic loss), animals can be certified in less time
    - But a limited amount of total production can be from these animals
- Broilers and other fowl (certified meat):
- Day-old chicks can be from any source
- Maximum age for conversion is 1 day old
- Concepts embedded in definition or list in preamble
  - Day-old chicks can be from any source
  - Maximum age for conversion is 1 day old
    - If not, then time required under organic management for eggs to be certifiable
- Animals for non-edible livestock products:
  - Conversion time under organic feed requirements
  - Conversion time under organic healthcare requirements

Housing and husbandry
- Slaughter and dairy mammals:
  - Edible bedding must be certified organic
  - Access to indoor or outdoor exercise areas is required (season/weather permitting)
  - Daily access to outdoors is required (weather and stage of production permitting)
  - Standards specify access to outdoor areas with green pasture
  - Routine or extended indoor confinement prohibited
  - When animal is indoors, free access to a non-cement floor is required
- Poultry for meat and eggs:
  - Edible bedding must be certified organic
  - Regular access to outdoor areas is required (weather and stage of production permitting)
  - Standards specify access to outdoor areas with green pasture
  - Housing in indoor fixed cages is prohibited
  - Lifetime indoor housing/confinement explicitly prohibited
  - Quantitative requirement of floor space per bird

Feed requirements
- Ideally, feed should come from on-farm
- Percent certified organic feed required (all animals)
- Limited proportion of total feed can be from additives, supplements, or concentrates
- 'Hot' dairy ration prohibited, or roughage/pasture must be offered as free choice
- Roughage (fresh plants, hay, etc.) must be offered to poultry
- Emergency feed provisions mentioned in standards
  - Producer's organic plan must include provisions for emergency shortage of certified organic feed
  - Absolute time limit stated for emergency feed allowances
  - Labeling restrictions on livestock products, if emergency feeding is required

(Continues)

Table 3. Criteria for comparison of organic certification programs (Continued)

Healthcare requirements
- Preventative care emphasized as first defense
- Withholding treatment from sick animal is grounds for decertification
- Mandatory withdrawal period following approved internal use of synthetic antibiotics:
  - In slaughter mammals
  - In dairy mammals (for existing organic herd)
- Mandatory withdrawal period following approved internal use of synthetic parasiticides (dewormers):
  - In slaughter mammals
  - In dairy mammals (for existing organic herd)
- Subtherapeutic use of antibiotics is prohibited

Enforcement procedures
- Organic plan emphasized as enforcement tool
- Audit trail emphasized as enforcement tool
- Medical records for individual animals (or flocks, for fowl) must be traceable through life cycle
  - Animals must be individually identified on body by physical marker or tag (except fowl)
- Record keeping system must be adequate to ensure products of treated animals are not labeled organic
  - Animals treated with prohibited materials must be identified on body of animal (with tag, etc.) to ensure no confusion (except fowl)
- Certifier offers conversion program for producers interested in conversion
- Certifier offers transitional certification for livestock products

Organic processing and handling

Product guidelines by labeling category
- 'Organic' on principal display panel (PDP) requires 95±100% organic ingredients
  - Requires a different percentage
- 'Made with organic' (MWO) on PDP requires 50±95% organic ingredients
  - Requires 70±95% organic ingredients
- Products with some organic ingredients, but not enough to make the 'MWO' cutoff, can say 'contains organic [ingredients]' on information panel
  - Organic ingredients cannot be identified if entire product does not meet criteria for 'organic' label
- Certification of processing is required for 'organic [product]' and 'MWO [ingredients]' label claims
- Certification of processing is required even if labeling only identifies organic ingredients on side panel

Product composition
  - For 'organic' and 'MWO' products:
  - Non-agricultural ingredients should be minimized
  - Certifier encourages using 100% organic ingredients, or requires preferential use of organic ingredients
  - Genetically engineered ingredients are prohibited
  - Irradiated ingredients are prohibited
  - Nutritional quality should be preserved in processing
    - This is emphasized in processing section, not just in principles of organic production
- Certifier allows an expanded set of non-agricultural ingredients in 'MWO' products
- Certifier allows any ingredient to be used in 'COI' products that are certified organically processed
- Processors making only 'COI' products are exempted from some non-composition requirements

Facility management
- Organic plan is required
- 'Parallel production' is allowed, if additional record keeping/organizational requirements are met
- Procedures to ensure organic integrity
  - HACCP or similar system involving critical control points
  - ISO 9000 series certification
- Extra withdrawal time required after fumigation with a prohibited material
- Regular or required residue testing of products
- Certifier can test for residues if reason for suspicion
- 'Ecologically sound' waste management plan
- Producer must minimize packaging

Handling regulations
- Certifier has detailed description of requirements for non-processor handlers
- Handlers dealing in only MWO or COI products are subject to less restrictive standards
- Handlers are subject to less restrictive standards or a less thorough certification and inspection process, if organic sales are below a specified level
- With each transaction in supply chain, both buyer and seller (if certified) must record transaction, date, and volume exchanged

(Continues)

Table 3. Criteria for comparison of organic certification programs (Continued)

All processors and handlers must maintain audit trail sufficient to track raw materials from supplier to retail
On-farm processors must meet all processing standards

Organic labeling guidelines
- Processed and unprocessed products labeled 'organic'
- Certifier must pre-approve entire label
- Label on retail item must identify certifier of the final handler or distributor of product
- Certifier contact information is required on retail item
- In multi-ingredient products, listing same ingredient from organic and non-organic sources is prohibited
- In multi-ingredient products, listing an ingredient as 'organic when available' is prohibited

All products labeled 'organic'
- 'Transitional' product labeling
  - Transitional product certifiable
  - Transitional product can use same logo as certified organic
  - Label, seal, or statement contains the word 'organic'
- Labeling through distribution chain:
  - 'Organic' required on invoice
  - 'Organic' required on non-retail container (box, bin, case, and/or pallet)
  - Certifier ID required on invoice
  - Certifier ID required on non-retail container (box, bin, case, and/or pallet)
- Program provides another certification, in addition to 'organic' or 'transitional'
- Seal is a registered trademark

Statements on packaged multi-ingredient foods
- For products labeled 'organic' on PDP:
  - Certifier name may appear on PDP
  - Certifier logo may appear on PDP
  - Certifier name may appear on label
  - Certifier logo may appear on label
  - 'Organic' must be smaller than product ID
  - Individual identification of organic ingredients on information panel
  - Statement of percent organic ingredients
- For products labeled 'Made With Organic ingredients' on PDP:
  - Certifier name may appear on PDP
  - Certifier logo may appear on PDP
  - Certifier name may appear on label
  - Certifier logo may appear on label
  - On PDP, 'organic' must be smaller than product name
  - Individual identification of organic ingredients on information panel
  - Statement of percent organic ingredients
- For products labeled 'Containing Organic Ingredients' on side panel:
  - 'Organic' may not appear on label at all
  - Certifier name may appear on PDP
  - Certifier logo may appear on PDP
  - Certifier name may appear on label
  - Certifier logo may appear on label
  - Individual identification of organic ingredients on information panel
  - Statement of percent organic ingredients

Certification program management

General points
- Confidentiality policy prohibits undue disclosure by inspectors and decision makers
- Written conflict of interest policy prohibits financial interactions between applicants and inspectors/ decision makers, at time of application
  - And also 1 year before application
  - And also 1 year after application
- Annual renewal of certification
- Annual inspection of operation
- Certifier performs unannounced second inspection on all first-time applicants
- Certifier performs unannounced inspections on a random set of recertifying operators
- Certifier reserves the right to make unannounced inspections at any time

(Continues)

Table 3. Criteria for comparison of organic certification programs (Continued)

- Certifier will investigate reasonable reports of violations
- Certified operator can appeal decertification decision

Organizational structure
- Program is run by non-profit organization
- Program is run by for-profit organization
- Program is self-sufficient in funding
- Certifier employs permanent staff
- Private programs: program is linked to an advocacy or education organization
  - Board of Directors of this organization has final decision in writing standards
  - Board of Directors of this organization has final authority for de/certification decisions
- State programs: program has advisory board
- Advisory board is mandated by statute
  - Board has input in standards decisions
  - Board has final decisions for standards
  - Board has input in de/certification decisions
  - Board has final decision for de/certification

Interactions with other certifiers and national bodies
- Certifier communicates with other certifiers regarding standards or consistency
  - Standards state intent to compare with other standards or achieve consistency
  - Certifier is in the Organic Certifiers Council of the Organic Trade Association (OCC)
  - Certifier is in National Association of State Organic Programs (NASOP)
- Certifier has standing recognition agreements, verbal or written
- Certifier offers document review process for recognition of other organic certifications
- Certifier is accredited by IFOAM
- Certifier is licensed, authorized, or approved in some way be state(s) in which it operates

Basis for certification fees
- Producers: Basis for fee
  - By sales volume
  - By physical size of operation
  - Flat fee for all producers
  - By another criterion
  - Fee pays for one or more inspections
  - Fee pays for one or more residue tests
- Processors: Basis for fee
  - By sales volume
  - Flat fee for all processors
  - By another criterion
  - Fee pays for one or more inspections
  - Fee pays for one or more residue tests
- Handlers: Basis for fee
  - By sales volume
  - Flat fee for all handlers
  - By another criterion
  - Fee pays for one or more inspections
  - Fee pays for one or more residue tests

COI, contains organic [ingredients]; GEO/GMO, genetically engineered/genetically modified organisms; HACCP, Hazard Analysis Critical Control Point; IPM integrated pest management.

The comparison is organized into seven sections:

1. Principles and general goals of organic production
2. Regulation of materials
3. Organic crop management
4. Organic livestock production
5. Organic processing and handling
6. Organic labeling guidelines
7. Certification program management

Because of the complexity of the task, and because certification decisions are often made based on operating procedures that are not fully explained in written standards, we verified the accuracy of our comparison with each certifier involved. We circulated a preliminary copy of the comparison to the 18 programs and asked program personnel to correct any misinterpretations. In our follow-up calls, we spoke extensively with representatives from every program.

Table 4. Labeling guidelines for multi-ingredient processed foods

Category of organic labeling	Certifier name allowed on PDP[1]	Certifier logo allowed on PDP[1]	Certifier name allowed on label but not on PDP[2]	Certifier logo allowed on label but not on PDP[2]	Individual ingredient identification (on side panel)	Percent organic ingredients (on side or front panel)
Organic	16/16	16/16	0/16	0/16	Required: 5 Optional: 11	Required: 3 Optional: 13
Made with organic ingredients	4/9	0/9	4/9	4/9	Required: 6 Optional: 3	Required: 4 Optional: 5
Contains organic ingredients	0/9	0/9	7/9	1/9	Required: 6 Optional: 2 Prohibited: 1	Required: 4 Optional: 4 Prohibited: 1

[1] The numerator indicates the number of certifiers who permitted (or required) the use of their name or logo on the principal display panel (PDP) of the label for each labeling category. (In all cases, certifiers who permitted their name or logo on the PDP also allowed it elsewhere on the label.) Denominators vary because some certifiers did not have comprehensive guidelines for some labeling categories.

[2] The numerator indicates the number of certifiers who permitted (or required) the use of their name or logo only on a side panel of the label; that is, on the label but not on the PDP. Denominators vary because some certifiers did not have comprehensive guidelines for some labeling categories.

Table 5. Key points in comparison of certification programs.

Similarities

Overall, the 18 standards compared were substantially similar in the methods and standards for organic certification. Similarities included:

- Primacy of the organic plan in making certification decisions
- Systems of regulating materials, including criteria used to judge materials for organic acceptability
- Most aspects of crop production standards
- General conception of organic livestock production as maximizing animals' health, including some specific aspects of livestock production standards, such as the requirement for 100% organic feed
- General allowances for product composition for multi-ingredient foods
- Requirements for organic handling, where programs had such standards
- Some aspects of labeling guidelines
- Most aspects of administrative procedures

Differences

Areas with substantial differences included:

- Goals of organic production and how goals were put in practice
- Restrictions on some materials permitted in crop production
- Livestock housing, health care, feed, and conversion times
- Completeness of standards for organic handlers
- Residue testing: most certifiers set limits on pesticides or other prohibited materials that could be in certified organic food, but few conducted regular residue tests
- Allowed and prohibited statements on product labels, including differences in when logo or name of certifier could be used on some multi-ingredient products
- Standards for transitional organic production, including use of `certified transitional organic' or similar label
- Possible deviations between written and enforced standards

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