

August 2012

Economic Impact Analysis of Proposed Regulations for Living Conditions for Organic Poultry

Phase 3 Report

Prepared for

U.S. Department of Agriculture
Agricultural Marketing Service
National Organic Program
1400 Independence Avenue SW
Room 2646 South Building
Washington, DC 20250

Prepared by

Tomislav Vukina
Vukina et al. Consulting
Raleigh, NC 27612

Kenneth Anderson
North Carolina State University
Raleigh, NC 27695

Mary K. Muth
Melanie Ball
RTI International
Research Triangle Park, NC 27709
(RTI Project #0213213.000.001)

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Preface

In September 2011, the U.S. Department of Agriculture's (USDA's) Agricultural Marketing Service (AMS) contracted with Vukina et al. Consulting to conduct a regulatory impact analysis on proposed changes to living standards for organic poultry. Vukina et al. Consulting completed three major steps (or phases) to conduct work under this contract:

- [Phase 1: Evaluate and Document a Baseline Scope of the Industry](#)
- [Phase 2: Conduct Economic Impact Analysis of the Proposed Rule](#)
- **Phase 3:** Prepare the Economic Analysis for Inclusion in Proposed Regulations

This document contains the Phase 3 report with relevant data and results from the earlier phases.

1 Background

The USDA Agricultural Marketing Service includes the National Organic Program (NOP). As part of the rulemaking process, the AMS conducts economic impact analyses of amendments to the national standards for production and handling of organic agricultural products. With potential changes in the requirements for living conditions for organic poultry, the NOP must consider the economic effects of these changes on the regulated industry.

The USDA NOP regulations at 7 CFR Part 205 set forth the national standards for production and handling of organic agricultural products. The NOP regulations were first published in 2000. In February 2010, AMS amended these regulations to include a substantial practice standard amendment regarding access to pasture for livestock. Poultry living conditions are regulated by § 205.238 (Livestock Health Care Practice Standard) and § 205.239 (Livestock Living Conditions).

The NOP regulations do not set specific stocking rates for either inside housing or the outside access areas, and further elaboration may be needed to ensure consistent regulatory implementation and enforcement. The NOP issued a general policy memo in October 2002 (NOP Policy Memo 11-5; reissued January 31, 2011) affirming that outside access areas are required, but it did not specify size or other details. In October 2002, an AMS appeal decision found that outdoor access could be provided by a fenced, roofed, and floored outside area (a "porch" attached to a poultry house) for the operation involved in the appeal. The NOP subsequently provided a memo regarding exemption to outside access for purposes of biosecurity (NOP Policy Memo 11-12, issued November 2005, reissued January 2011).

The National Organic Standards Board (NOSB), the NOP's federal advisory committee, made recommendations in April 2002, November 2009, and December 2011 on animal welfare issues. The NOSB also completed additional changes concerning appropriate living conditions for poultry at their December 2011 public meeting. The NOP requested an economic analysis of two options for regulations

regarding outdoor access for poultry based on NOSB recommendations and independent animal welfare standards, compared to existing regulations. The NOP may pursue a regulatory amendment to § 205.239 in accordance with NOSB final recommendations, which would clarify requirements for outside access and other living conditions for poultry.

2 Objectives

The objective of this project was to provide an independent economic impact analysis of possible regulatory changes for the living conditions for organic poultry, including a justification of the methodology. The complete analysis estimates the costs and benefits of implementing the proposed rule, compared with alternatives (as per Executive Order 12866). Alternatives include (1) no change to existing rule, (2) regulatory Option 2, and (3) regulatory Option 3. All work was conducted to comply with the USDA Information Quality Activities Regulatory Guidelines. The objective of this Phase 3 report was to provide the regulatory impact assessment and regulatory flexibility analysis based on the earlier phases of the project.

Regulatory Impact Assessment for Proposed Changes in Living Conditions for Organic Poultry (Executive Order 12866 and Executive Order 13563)

Executive Orders 12866 and 13563 direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects; distributive impacts; and equity). Executive Order 13563 emphasizes the importance of quantifying both costs and benefits, reducing costs, harmonizing rules, and promoting flexibility. This rule has been designated an “economically significant regulatory action” under section 3(f) of Executive Order 12866. Accordingly, the rule will be reviewed by the Office of Management and Budget.

The benefits and costs are summarized in Table I-1 and described in detail in this section.

Table I-1. Summary of Costs and Benefits

Costs	Benefits
Option 2	
- Organic broilers: negligible - Organic eggs: negligible	- Fosters transparency of standards for living conditions for organic poultry - Facilitates enforcement of animal welfare standards for organic poultry
Option 3	
- Organic broilers: \$2.4 million annually - Organic eggs: \$68 million annually	- Fosters transparency of standards for living conditions for organic poultry - Facilitates enforcement of animal welfare standards for organic poultry - Increases consumer willingness to pay for organic poultry and eggs resulting from improved living conditions

A. Baseline

Based on data obtained by USDA-AMS from 36 USDA-accredited state and private organic certifiers in 2011, approximately 580 producers produce organic eggs, 138 produce organic pullets as inputs into layer operations, 288 produce organic broilers, and 111 produce organic turkeys. Table I-2 shows the number of birds on farms, number of producers, and number of operations for each type of

Table I-2. Number of Certified Organic Poultry and Egg Producers and Operations, 2011

Stock or Species	Number of Birds	Number of Producers	Number of Operations
Layer hens (inventory)	7,673,085	580	499
Pullets	4,785,493	138	112
Broilers	30,049,372	288	192
Turkeys	785,561	111	103

Source: Based on information collected by USDA-AMS from 36 USDA-accredited state and private organic certifiers.

product as calculated in Vukina et al. (2012a). Producers are contract operators of farms that produce organic products. In contrast, operations are the certified entities through which producers contract for the sale of their products. The nature of this relationship means that each operation can have multiple producers; thus, the number of operations is somewhat less than the number of producers for each type of product.

Based on the information collected by USDA-AMS from the USDA-accredited certifiers, organic producers range in size from fewer than 100 birds to several hundred thousand birds. The average size of organic producers is as follows: 17,000 birds for organic eggs, 50,000 birds for organic pullets, 61,000 birds for organic broilers, and 6,000 birds for organic turkeys. According to the USDA National Agricultural Statistics Service 2008 Organic Production Survey, the top-producing states for organic eggs, broilers, and turkey were California and Pennsylvania. Specifically, California comprised 18%, Pennsylvania comprised 15%, and Iowa comprised 6% of organic egg production. For organic broiler production, California comprised 67%, Pennsylvania comprised 8%, and Iowa comprised 7%. For organic turkey production, California comprised 49%, Pennsylvania comprised 14%, and Wisconsin comprised 2%.

Since 2000, the production of certified organic eggs has increased steadily from 21.6 million dozen to 148.9 million dozen in 2011, a sevenfold increase. Although certified organic egg production comprised less than 0.3% of total egg production in 2000, it comprised more than 2.1% of total egg production in 2011. As shown in Table I-3, the total value of organic egg production totaled \$400.4 million in 2011. Because of the higher average farm price of organic eggs, \$2.69 per dozen, compared with conventional eggs, \$1.07 per dozen, the total value of organic egg production was 5.4% of the total value of egg production.

Inventories of organic broilers and organic turkeys on farms are substantially larger than in 2011 compared with 2000, but the inventories have fluctuated substantially year to year. Inventories of organic broilers were 1.9 million birds in 2000, increased to a peak of 10.4 million birds in 2005, and were 6.0 million birds in 2011. As shown in Table I-3, in 2011, organic broiler production was approximately 93.6 million pounds valued at \$220.0 million, which is less than 1% of the total value of all broiler production.

Inventories of organic turkeys were 9,000 birds in 2000, increased to a peak of 399,000 birds in 2008, and declined to 224,000 birds in 2011. As shown in Table I-3, in 2011, organic turkey production was

Table I-3. Production Volumes and Values for Organic Eggs, Organic Broilers, and Organic Turkeys in 2011

	Production Volume	Total Production Value	% of Organic to Total Value
Organic eggs	148.9 million dozen	\$400.4 million	5.4%
Organic broilers	93.6 million pounds	\$220.0 million	0.8%
Organic turkeys	16.4 million pounds	\$44.5 million	0.8%

approximately 16.4 million pounds valued at \$44.5 million, which is less than 1% of the total value of all turkey production.

B. Alternatives Considered

Alternatives to this proposed rulemaking are to (1) make no substantial changes to the existing regulation, (2) adopt modified animal welfare standards similar to existing standards, and (3) adopt animal welfare standards that differ substantially from existing standards. The implementation period for Options 2 and 3 is 5 years.

Option 1 provides for no substantial changes to existing regulations. Living conditions under 205.239 do not specify indoor or outdoor stocking rates but require maintaining year-round living conditions that accommodate the health and natural behavior of animals. All animals must have year-round access to the outdoors, shade, shelter exercise areas, fresh air, clean water, and direct sunlight suitable to the species, stage of life, and climate. Use of covered porches or runs is acceptable and soil contact is not required. Pullets may be confined until 20 weeks of age if necessary (per 205.239(b)).

Option 2 is similar to existing animal welfare standards. In indoor housing, birds must be able to move freely and engage in natural behaviors (turn around, flap wings, scratch, and dust bathe). Scratch areas and dust baths must be provided. Houses with slatted floors must have a minimum of 15% of available floor space as dust bathing areas. For layers, perches are required with a minimum of 6 inches per bird, rails may be included in front of nest boxes, and the floor may be slatted or mesh. Layers in single level houses must have 1.5 square feet, layers in raised roost type houses must have 1.2 square feet, and layers in multitier houses must have 1.0 square feet provided that overhead perches and platforms provide for at least 55% of hens to perch. Broilers must have no more than 7 pounds liveweight per square foot, and turkeys must have no more than 7.5 pounds liveweight per square foot. Natural light is required such that reading is possible on a sunny day with the lights turned off. With artificial lighting, a dark period of at least 8 hours must be provided each day. Ventilation must be sufficient to ensure less than 25 ppm ammonia.

Under Option 2, exit doors must be distributed around the building and provide ready access to the outdoors such that more than one bird can exit at a time. Exit doors must be at least 16 inches wide by 14 inches high for layers, 2 feet wide by 18 inches high for broilers, and 3.3 feet high by 5 feet wide for turkeys. For outdoor access, pullets must be outside by 16 weeks, broilers by 4 weeks, and turkeys by 12 weeks. Outdoor access must be available when temperatures are over 50°F and provide direct sunlight although solid roofs are allowed. The surface of the run can be concrete but must have a well-maintained substrate of sawdust and wood chips, and scratch areas and dust baths in soil or suitable substrate must be available. Layers and broilers must have a minimum of 2.0 square feet per bird for a minimum of 5% of the total flock population, and turkeys must have a maximum of 7.5 pounds per square foot. Mobile outdoor pen units must provide a minimum of 2 square feet per bird and be moved to provide vegetative cover at all times.

Option 3 modifies the indoor living conditions (205.239) under Option 2 to provide more indoor space, minimum requirements for scratch areas and dust baths, and more exit door area and modifies outdoor living conditions to eliminate solid roofs, specify stocking rates, require soil scratching areas, and required year-round vegetative cover.

Under Option 3, stocking rates, which are calculated by the floor perimeter of the building not including nest boxes or perch areas, must provide a minimum of 2 square feet per period, a maximum of 5 pounds liveweight per square foot for broilers, 5.3 pounds liveweight for turkeys, and 3 pounds liveweight for pullets. For layers, perches are required with 6 linear inches per bird with at least 35 cm elevation. Pullets must have perches at 4 weeks of age. Scratch areas and dust baths must be available for at least 30% of available floor space. Houses with slatted floors are permitted if scratch areas are provided.

For Option 3, exit doors must provide ready access to the outdoors with a minimum of 6 linear feet per 1,000 birds and a minimum height of 14 inches. For the outdoor area, no solid roofs are permitted except for shade structures, a shaded area must be provided in warm weather, and birds must have soil contact. In addition, 50% vegetative cover must be provided year-round. Layers must have a minimum of 2 square feet per bird, broilers must have a maximum of 5 pounds liveweight per square foot, and turkeys must have a maximum of 3.5 pounds liveweight per square foot.

C. Benefits of the Regulation

The proposed options will result in nonmonetary benefits and monetary benefits reflected in the marketplace. For both Options 2 and 3, the nonmonetary benefits include fostering transparency of standards for living conditions for organic poultry and facilitating enforcement of animal welfare standards for organic poultry. Because the majority of operations of all sizes currently operate under conditions similar to Option 2, monetary benefits in the marketplace are negligible. Furthermore, the smallest size operations also currently operate under conditions similar to Option 3; thus, monetary benefits in the marketplace are negligible. However, monetary benefits will occur for larger size operations under Option 3.

Estimation of the monetary benefits of the regulatory options relies on the benefits transfer approach, which consists of a systematic review of the economic literature to determine if benefits estimates can be transferred from other similar studies and adjusted to reflect the regulatory options. The most important part of the proposed regulations for living conditions for organic poultry relates to reducing stocking densities, both indoors and outdoors; thus, studies addressing this particular aspect of animal welfare improvement are most relevant. The economics literature shows that consumers value improvements in animal welfare and the hypothetical willingness to pay for increased animal space could be quite substantial.

For the organic broilers industry segment, as shown later, the representative organic broiler producers already satisfy the regulatory requirements related to stocking rates proposed in Option 2; hence, the willingness to pay for the reduction in animal density to below 7 pounds per square foot has been already incorporated into the price of organic poultry. Therefore, no additional benefits are associated with Option 2. In contrast, Option 3 should generate additional benefits in the 30% range. This estimate is obtained by taking the lower bounds of the obtained intervals of peoples' stated preferences for increased animal space found in the related literature (McVittie, Moran, and Nevison, 2006) as the upper bounds for our regulatory benefit estimates. Therefore, even with this conservative approach, the shifts in consumer preferences associated with the perceived improvement in animal welfare will amount to an outward shift in the demand curve by 30%.

For the organic egg industry segment, the literature does not contain any consumer preference studies of animal welfare (living conditions) that are similar to the regulatory options. As with broilers, the representative organic egg producer already satisfies the regulatory requirements related to stocking rates proposed in Option 2. Therefore, the willingness to pay for the reduction in animal density has been already incorporated into the price of organic eggs, so no additional benefits are associated with Option 2. For Option 3, the benefits are likely similar across poultry species, such that in percentage terms, the demand shift of 30% is the same for organically produced eggs as it is for broilers.

D. Costs of Proposed Options

The cost estimation methodology involves two steps: estimating the baseline cost structure and break-even price and analyzing whether the regulatory options will have an impact on the established baseline cost structure. All regulatory requirements that could have an effect on a representative operation's baseline costs were quantified to obtain the new (post-regulation) cost structure and the new break-even price. The comparison of the new (post-regulation) and old (baseline) break-even prices is expressed as a percentage increase in the break-even price relative to the baseline and represents the cost increase due to regulation.

All baseline and cost-shifting scenarios are based on the assumption of a representative producer. To the extent that the entire industry (eggs or broilers) is fairly homogenous with respect to its cost structure within each size category, the representative agent approach is adequate. However, if the production technologies used in the industry vary substantially, then the representative agent approach might not capture all specific details of the different production processes. All cost-shift scenarios are based on the intermediate length of the run (5-year horizon) in which changes in variable costs through

inputs and output adjustments are possible together with some changes in fixed costs through small adjustments in land, buildings, and equipment. However, potential entry and exit of firms, as well as new construction of large-scale production facilities by existing firms as the result of regulation, is assumed not to occur.

The proposed regulation regarding the indoor and outdoor stocking rates was analyzed by first adjusting the indoor stocking rates by reducing the number of animals until the stocking rate is achieved. Thus, it was assumed that producers would not opt to construct a brand new housing facility to satisfy the indoor stocking rate constraint to keep the production at the original preregulation level. After this adjustment took place, the new proposed outdoor stocking rate might require a producer to purchase additional land at the prevailing market land prices. In some cases, the stocking rate regulation requirements are so restrictive that the reduction in revenue associated with the required reduction in the number of animals and the corresponding increase in average total cost will likely force some producers to exit.

Analysis of the costs of the regulatory options focuses on the following types of operations:

- organic layers: small flock (fewer than 16,000 layers), midsize flock (between 16,000 and 100,000 layers), and large flock (more than 100,000 layers)
- organic broilers: small flock (fewer than 100,000 birds per year) and large flock (more than 100,000 birds per year)

Organic turkeys comprise a much smaller portion of the market and likely have cost increases similar to organic broilers.

D.1 Regulatory Costs for Organic Egg Production

The representative typical organic egg producers regardless of size currently operate under the requirements proposed under Option 2; hence, the impact of proposed regulation on the break-even price is negligible. In contrast, the regulatory proposal summarized in Option 3 will have effects on the cost structure of representative medium- and large-scale organic egg producers through the following:

- a one-time (fixed) cost associated with retrofitting the house to install more exit holes;
- an increased requirement for more outdoor access, which will be reflected in fencing costs and the increased cost of land;
- increased mortality and reduced feed conversion associated with a substantially increased outdoor area; and
- additional heating costs to maintain the indoor environment within the thermal neutral zone of the chickens.

The majority of small-scale organic egg producers already meet the requirements of both regulatory options, so estimated costs are negligible.

For large producers, the most significant effect of the Option 3 regulation will be reflected in the requirement to significantly reduce the population density on the established farms in response to the proposed regulation regarding the indoor density with a large effect on the revenue reduction that could cause some of the large producers to exit the organic industry and convert their operations into conventional egg production. Based on the analysis in Vukina et al. (2012b), the combined effect of the Option 3 proposed regulation is estimated to be a 6.7% increase in the break-even price for midsize producers and a 96% increase in the break-even price relative to the baseline cost scenario for large producers as shown in Table I-4.

Table I-4. Comparison of Baseline and Option 3 Costs for Producing Organic Eggs, Midsize and Large Operations, 2011

	Midsize Operations (16,000–100,000 layers)		Large Operations (>100,000 layers)	
	Baseline	Option 3	Baseline	Option 3
<i>Production volume</i>				
Birds per operation	16,000	14,000	100,000	13,500
Organic eggs (dozen)	314,899	261,595	1,968,120	265,696
Breaker market eggs (dozen)	78,725	65,399	492,030	66,424
<i>Costs per farm</i>				
Total fixed costs	\$518,225	\$523,900	\$3,986,200	\$3,986,200
Annualized fixed costs	\$58,210	\$58,454	\$418,234	\$414,184
Variable costs	\$779,345	\$680,717	\$4,661,742	\$882,758
Total annual costs	\$837,555	\$739,172	\$5,079,975	\$1,296,943
<i>Breaker market eggs revenue adjustment^a</i>	\$58,256	\$48,395	\$364,102	\$49,154
<i>Costs per dozen eggs</i>				
Break-even revenue per bird	\$48.71	\$49.34	\$47.16	\$92.43
Break-even price per dozen organic eggs	\$2.47	\$2.64	\$2.40	\$4.70
Percentage increase over baseline	—	6.7%	—	96.0%

^a Breaker market egg price assumes \$0.74 per dozen.

D.2 Regulatory Costs for Organic Broiler Production

The organic broiler producers regardless of size currently operate under the requirements proposed under Option 2. In contrast, the regulatory proposal summarized in Option 3 will have multiple effects on the cost structure of a representative large-scale organic broiler producer through the following:

- a one-time (fixed) cost associated with retrofitting the house to install more exit holes;

- an increased requirement for more outdoor access, which will be reflected in the increased cost of land; and
- increased mortality associated with a substantially increased outdoor area.

The majority of small-scale organic broiler producers already meet the requirements of both regulatory options; therefore, estimated costs are negligible.

Based on the analysis in Vukina et al. (2012b), the combined effect of all three effects on the cost structure for large producers is estimated to be a 2.3 % increase in the break-even price relative to the baseline scenario as shown in Table I-5.

Table I-5. Comparison of Baseline and Option 3 Costs for Producing Organic Broilers, Large Operations (Greater than 100,000 Birds Annually), 2011

	Baseline	Option 3
<i>Production volume</i>		
Birds per operation	300,000	300,000
Pounds per operation (live)	1,282,500	1,242,000
<i>Costs per farm</i>		
Total fixed costs	\$589,600	\$594,400
Annualized fixed costs	\$59,303	\$59,689
Variable costs	\$1,274,588	\$1,261,200
Total annual costs	\$1,333,890	\$1,320,889
<i>Costs per pound</i>		
Break-even price per pound (live)	\$1.04	\$1.06
Break-even price per pound (dressed) ^a	\$0.81	\$0.83
Percentage increase over baseline		2.3%

^a Break-even price per pound based on an average liveweight of 4.5 pounds per bird and a dressing percentage of 78%.

D.3 Estimated Total Industry Costs

Using information collected by USDA-AMS from the USDA-accredited certifiers, an estimated 30% of organic eggs are produced by “small” producers, 54% by “medium” producers, and 16% by “large” producers. For broilers, only 1% of production is produced by “small” producers, and the remaining 99% is produced by “large” producers. The distribution of producers by size shows that 74% of egg producers are estimated to be small, 25% are estimated to be medium, and only 1% is estimated to be large. For broilers, 68% of producers are estimated to be small and 32% are estimated to be large.

The total estimated industry costs due to the proposed regulation under Option 2 are negligible. As shown in Table I-6, the total annual regulatory costs under Option 3 are estimated to be \$68.1 million for organic eggs and \$2.4 million for organic broilers for a total of \$70.6 million. These estimates

Table I-6. Total Estimated Annual Industry Regulatory Costs under Option 3

	% of Production	Baseline No. of Units ^a (000s)	Units	2011 Total Industry Revenue ^a (\$000s)	Regulatory Cost per Unit	Total Industry Costs
Total Organic Egg Production^b	100%	148,858	Dozen eggs	\$400,366	\$0.09	\$68,118
Eggs, small operations (inventory fewer than 16,000 birds)	30%	44,657	Dozen eggs	\$120,110	Negligible	\$0
Eggs, midsize operations (inventory of 16,000–100,000 birds)	54%	80,383	Dozen eggs	\$216,197	\$0.17	\$13,334
Eggs, large operations (inventory greater than 100,000 birds)	16%	23,817	Dozen eggs	\$64,058	\$2.30	\$54,784
Total Organic Broiler Production^c	100%	105,473	Pounds, dressed	\$247,862	\$0.02	\$2,448
Broilers, small operations (annual production fewer than 100,000 birds)	1%	1,055	Pounds, dressed	\$2,479	Negligible	\$0
Broilers, large operations (annual production greater than 100,000 birds)	99%	104,419	Pounds, dressed	\$245,384	\$0.02	\$2,448
Total for Organic Eggs and Broilers				\$648,228		\$70,566

^a Source: Revenue derived from production estimates obtained by USDA-AMS from 36 USDA-accredited state and private organic certifiers (2011) and prices based on simple averages of monthly prices provided by Lawrence Haller, Chief Economist, USDA-AMS, Poultry Programs.

^b Total estimated dozens of organic eggs are based on laying hen counts published by USDA-NASS (2012a, 2012b), assuming 19.4 dozens of eggs per laying hen.

^c Total estimated ready-to-cook organic chicken based on organic broiler numbers from USDA-NASS (2010) and data obtained by USDA-AMS (2011), an average weight of 4.5 live pounds per bird, and a dressing percentage of 78%.

represent 17% of estimated total industry revenue for organic eggs and 1% of estimated total revenue for organic broilers.

D.4 Estimated Market Effects of the Proposed Regulation

In response to the increased costs of the proposed regulation and consumer perceptions of the benefits of the proposed regulation in terms of improved living conditions, the markets for organic eggs and poultry will adjust. Because most producers are currently operating under conditions similar to Option 2, no further market adjustments are anticipated. If Option 3 is implemented, the increased costs of the proposed regulation will shift the supply curve upward for organic eggs and poultry. To the extent

that consumers may be willing to pay more for organic eggs and poultry as a result of the regulation, the demand curve for organic eggs or poultry will also shift upward.

Using an equilibrium displacement modeling approach, which assumes that organic and conventional poultry and egg products are substitutes in consumption and production and markets are perfectly competitive, the market impacts of Option 3 were estimated for the egg and broiler markets (Vukina et al., 2012b). The supply shifts were calculated as weighted averages of the per-unit regulatory costs across the different size categories resulting in the following estimates: 19.0% for organic eggs and 2.3% for organic broilers. The market effects were estimated with and without an estimated 30% increase in consumer willingness to pay for organic eggs and organic broilers.

The results of the egg market model show an increase in the price of organic eggs of 17.9% and a reduction in the quantity of organic eggs of 16.0%, assuming no changes in consumer willingness to pay. In the case of a 30% increase in consumer willingness to pay, the results of the egg market model show an increase in the price of organic eggs of 19.6% along with a 9.4% increase in the quantity of organic eggs.

The results of the broiler market show an increase in the price of organic broilers of 2.1% and a reduction in the quantity of organic broilers of 2.1%, assuming no changes in consumer willingness to pay. In the case of a 30% increase in consumer willingness to pay, the results of the broiler market model show a 4.0% increase in the price of organic broilers along with a 26.0% increase in the quantity of organic broilers.

In both the organic egg and broiler markets, total revenue will be relatively unchanged from the baseline assuming no change in consumer willingness to pay; therefore, profits will decline as a result of the increased costs of production. However, if consumer willingness to pay increases, increases in revenue may partially or fully offset the costs of the regulation. In all cases, some substitution will occur from the organic to the conventional product market as a result of increased prices in the organic market.

Regulatory Flexibility Analysis (5 U.S.C. et seq.)

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601-612) requires agencies to consider the economic impact of each rule on small entities and evaluate alternatives that would accomplish the objectives of the rule without unduly burdening small entities or erecting barriers that would restrict their ability to compete in the market. The purpose is to fit regulatory actions to the scale of businesses subject to the action. Section 605 of the RFA allows an agency to certify a rule, in lieu of preparing an analysis, if the rulemaking is not expected to have a significant impact on a substantial number of small entities.

Pursuant to the requirements set forth in the RFA, AMS performed an economic impact analysis on small entities in the final rule published in the *Federal Register* on December 21, 2000 (65 FR 80548). AMS has also considered the economic impact of this proposed action on small entities. Small entities include producers engaged in crop and animal production and handlers that process organic products or develop, market, and sell organic products. AMS has determined that this proposed rule will have a significant impact on a substantial number of small entities.

A. Affected Entities

The Small Business Administration (SBA) defines small agricultural firms based on annual sales receipts (13 CFR 121.201). The size standard is \$12.5 million in annual receipts for North American Industry Classification System (NAICS) code 112310 for chicken egg production. For agricultural firms producing broilers and other meat-type chickens (NAICS code 112310), turkeys (NAICS code 112330), and other poultry (NAICS code 112390) and operating poultry hatcheries (NAICS code 112340), the size standard is \$0.75 million in annual receipts. Although some organic chicken egg and organic broiler producers are considered large according to these standards, all organic turkey producers, other organic poultry producers, and organic poultry hatcheries are assumed to be classified as small.

The available data on the size of organic egg and broiler firms are based on production capacity of producers. Thus, production capacity data are converted to approximate annual sales receipts using baseline break-even prices. Some producers operate under multi-establishment operations, but data are unavailable on the sizes of the operations and the nature of ownership of the operations. Therefore, the analysis is based on the size of producers and thus may overestimate the number of small businesses.

The three size classifications used in the analysis for organic egg producers are as follows: small producers with fewer than 16,000 birds (74% of producers), midsize producers with 16,000 to 100,000 birds (25% of producers), and large producers (1% of producers) with greater than 100,000 birds. All three sizes of organic egg producers classified on the basis of the production capacity (number of layers) completely or partially fit into the SBA category of small businesses because the cut-off revenue is \$12.5 million. According to the production capacity classification, a large producer with 100,000 birds has estimated break-even revenue of slightly over \$5 million (see Appendix Table C-3 in Vukina et al. [2012b]). However, there are two caveats.

First, the production capacity interval for large organic egg producers used in the analysis does not have an upper limit because the technological characteristics, the cost structure, and hence the break-even price of all large producers with 100,000 layers or more are similar, but the total revenue (gross receipts) is different based on production volume. Large egg producers with approximately 250,000 layers or more would not fit the SBA small business category because their gross receipts would exceed the \$12.5 million limit. However, it is currently unknown how many organic egg producers operate with more than 250,000 layers.

Second, the production capacity classification is based on the capacity of individual producers, but individual producers could operate under contract with an integrator company. To the extent that the sum of the production capacities of several contract producers that produce eggs under contract for an integrator company exceeds 250,000 or more layers, that company would be classified as a large business. However, data are currently unavailable on the contracting relationships in the organic egg industry. In summary, all of the 430 small organic egg producers are likely small businesses, nearly all of the 145 midsize egg producers are likely single-establishment small businesses or owned by multi-establishment small businesses, and some if not all of the five large egg producers are likely single-establishment large businesses or owned by multi-establishment large businesses.

The two size classifications used in the analysis for organic broiler producers are as follows: small producers producing fewer than 100,000 birds per year (68% of producers) and large producers (32% of producers) producing more than 100,000 birds per year. All small organic broiler producers would be classified as small businesses with annual receipts of less than \$0.75 million. The baseline cost scenario for large organic broiler producers assumes 50,000 birds per flock and six flocks per year (total of 300,000 birds per year), which results in an estimated break-even revenue of \$1.34 million per year, which is greater than the \$0.75 million size standard. Thus, organic broiler producers operating under these assumptions would be classified as large businesses. In contrast, those with total annual placement of 150,000 birds or fewer would be classified as small business even if they are categorized as “large” according to the production capacity classification. However, some of those producers that would individually be classified as small businesses would not meet the size standard if they are part of the vertically integrated poultry company that contracts the production of organic broilers with individual producers.

In summary, all of the 195 small organic broiler producers are likely small businesses, and many of the 93 large organic broiler producers are likely single-establishment large businesses or owned by multi-establishment large businesses.

B. Applicability

The requirements under Options 2 and 3 would apply to all sizes of organic egg and poultry producers. However, nearly all organic egg and broiler producers operate under conditions similar to Option 2 and thus would likely not need to make substantial changes to comply with the requirements.

Under Option 3, all small organic egg producers operate under conditions similar to the proposed living standards, while some of the midsize and all of the large producers will be required to make

changes to comply with the regulation. Thus, the midsize organic egg producers that are classified as small businesses will incur costs to implement the Option 3 requirements; however, it is uncertain what proportion of the midsize organic egg producers are classified as small businesses.

Furthermore, under Option 3, all small organic broiler producers operate under conditions similar to the proposed living standards, but most large organic broiler producers will be required to make changes to comply with the regulation. The large organic broiler producers that are classified as small businesses will incur costs to comply with the regulation; however, it is uncertain what proportion of the large organic broiler producers are classified as small businesses.

C. Direct Costs

The direct costs of Option 2 for small businesses are anticipated to be negligible because nearly all small producers currently operate under conditions similar to the proposed living standards under Option 2. However, they will incur some costs to review the requirements of the regulation and determine whether their farms are currently satisfying the living standards specified under Option 2. Similarly, the direct costs of Option 3 for the small organic egg producers and small organic broiler producers are also anticipated to be negligible because they operate under conditions similar to the proposed living standards under Option 3.

A portion of the midsize organic egg producers would be classified as small businesses. Under Option 3, midsize organic egg producers would incur an estimated 6.7% increase in costs including annualized fixed costs, annual variable costs, and reduced revenue due to changes in production volumes estimated. Furthermore, a portion of the large organic broiler producers would be classified as small businesses. Under Option 3, large organic broiler producers would incur an estimated 2.3% increase in costs including annualized fixed costs and annual variable costs.

D. Indirect Costs

In addition to the direct costs of regulation addressed above, the proposed regulatory action could create other kinds of costs to the organic poultry industry and possibly also to closely affiliated industries such as the conventional poultry industry and the organic feed industry.

First, related to Option 3 is the problem of entry and exit of firms that the regulation could induce, which cannot be addressed within the structure of the market modeling approach. As mentioned before, large organic eggs producers, if faced with the Option 3 regulation, will likely exit the organic industry and become conventional egg producers. In the modeling approach, the implicit assumption is that they will not exit but instead would respond to the regulation with a substantial reduction in output. However, if large egg producers exit organic production and continue supplying the same number of eggs but to the conventional market, the conventional eggs market price would likely decrease substantially because of the large increase in quantity supplied. The extent of these adjustments in the conventional market is difficult to forecast. At the same time, the departure of large organic egg producers from organic production would cause a temporary sharp increase in the organic egg price because of the substantial reduction in quantity supplied. In the long run, this would attract new producers into the organic industry

and the price would return to a level similar to the baseline price (that is, the long-run equilibrium price) unless some other changes in technology or production factor prices occur.

Second, the departure of organic producers from the organic industry or even a sharp reduction in the volume of output as predicted by the market model could have potentially important impacts on the organic feed industry. The issue is best illustrated using the organic egg industry. Option 3 would result in no reduction in the number of layers for small producers, a 12.5% reduction for the midsize producers, and an 86.5% reduction for the large organic producers. Based on the estimates of the number of organic layers in 2011 of 7.7 million hens, which produced 148.9 million dozens of organic eggs, and the assumption that 80% of total egg production qualifies as organic eggs, whereas the remaining 20% goes into the breaker market, the estimated total number of eggs (organic and regular) produced is 186 million dozen or 24.24 dozen per hen per year. Furthermore, estimates of the size distribution of producers classify 54% of producers as midsize and 16% as large. Based on these estimates, the total industry-wide reduction in the number of laying hens due to the Option 3 regulation would amount to 1,579,888 million hens. Taking into account a preregulation feed conversion ratio of 3.8 pounds of feed per 1 dozen eggs and a worsened postregulation feed conversion ratio of 4.0, the total industry preregulation feed consumption at 706.8 million pounds would decline to a postregulation feed consumption at 591.0 million pounds. Assuming a typical layer feed ration consists of 70% corn and 30% soybeans and the fact that there are 56 pounds of corn in a bushel and 60 pounds of soybeans in a bushel, corn consumption by the organic egg production industry would decline from 8.8 million bushels preregulation to 7.4 million bushels postregulation, and soybean consumption would decline from 3.5 million bushels preregulation to 2.95 million bushels postregulation.

Calculating the indirect effect of Option 3 on the market for organic grains (corn and soybeans) requires information on average prices and total quantities of organically produced grains. Based on AMS market reporting data for 2011, the average price of organic corn was \$10.50 per bushel and the average price of organic soybeans was \$18.86 per bushel. Using the most recent data available from the Agricultural Census, 15.75 million bushels of organic corn and 2.58 million bushels of organic soybeans were harvested in 2008.

Taking the above data as reference points and assuming that demand for organic corn and soybeans is inelastic with an assumed price elasticity of -0.8 for each product, using the standard demand elasticity formula shows that the price of organic corn would drop by an estimated \$1.20 per bushel (11.5% decline), and the price of organic soybeans would drop by an estimated \$5.30 per bushel (28% decline). The estimated effects would be somewhat smaller if the organic grain production has increased since 2008, which is the most recent year for which data are available. Under the same set of assumptions, for every 10% increase in the organic grain production relative to the 2008 levels, the price decline would be mitigated by about 10 cents per bushel for corn and about 50 cents per bushel for soybeans.

E. Conclusion

Overall, the impact of the proposed changes under Option 2 on the organic poultry and egg industry are negligible because most producers are operating under conditions similar to the proposed living standards. Under Option 3, the impact of the proposed changes on small organic poultry and egg

producers are also negligible because most small producers are operating under conditions similar to the proposed living standards. However, costs will increase substantially under Option 3 for large organic egg producers and likely cause a substantial number of producers to exit organic production and switch to conventional production. The switch from organic to conventional production for large organic egg producers would also affect the markets for organic corn and soybean used as feed and cause a substantial decline in the price of organic feed. A portion of the midsize organic egg producers is small businesses, and they would incur a modest increase in costs of production under Option 3. In the organic broiler industry, costs would increase modestly under Option 3 for large organic broiler producers. A portion of the large organic broiler producers is small businesses, and they would similarly incur a modest increase in the costs of production under Option 3.

References

- McVittie, A., D. Moran and I. Nevison. 2006. “Public Preferences for Broiler Chicken Welfare: Evidence from Stated Preference Studies.” Land Economy Working Paper Series, SAC Edinburgh, EH9 3JG. <http://ageconsearch.umn.edu/handle/45990>
- U.S. Department of Agriculture (USDA), Agricultural Marketing Service (AMS). October 2011–December 2011. *Poultry Market News and Analysis Reports*. Washington, DC: USDA. <http://www.marketnews.usda.gov/portal/py>.
- U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). 2010. *Organic Production Survey—2008*. Data Product: Table 10. Organic Livestock and Poultry on Certified and Exempt Organic Farms: 2008. Washington, DC: USDA. http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Organics/index.php.
- U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). 2012a. *2010 Agricultural Statistics Annual*. Washington, DC: USDA. http://www.nass.usda.gov/Publications/Ag_Statistics/2010.
- U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). 2012b. “Chickens and Eggs—Average Number of ALL Layers During the Month.” Washington, DC: USDA. http://www.nass.usda.gov/Publications/Todays_Reports/reports/ckeg0112.pdf.
- Vukina, T., K. Anderson, M.K. Muth, and M. Ball. 2012a. *Economic Impact Analysis of Proposed Regulations for Living Conditions for Organic Poultry: Phase 1 Report*. Report prepared for the U.S. Department of Agriculture, Agricultural Marketing Service.
- Vukina, T., K. Anderson, M.K. Muth, and M. Ball. 2012b. *Economic Impact Analysis of Proposed Regulations for Living Conditions for Organic Poultry: Phase 2 Report*. Report prepared for the U.S. Department of Agriculture, Agricultural Marketing Service.