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## **The Environmental and Economic Impact of Withdrawing Antibiotics from US Broiler Production**

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### **Abstract**

Rising consumer interest in how food is produced has resulted in the growth of antibiotic-free meat production and consumption. The antibiotic-free classification is most prominent in the poultry market as several producers and retail-chain companies have moved their marketing in that direction. This study examines the environmental and economic impacts of withdrawing antibiotics (including animal-only ionophores) from U.S. broiler production. Two systems—conventional and 100% antibiotic-free (ABF)—are modeled, examining differences between average survivability, space requirements, days to grow-out a defined sized bird, and days between production cycles. Data were obtained from the USDA, industry sources (e.g., Agri Stats, Vantress, Aviagen), and expert knowledge. Total output is calculated to compare the average quantity of edible broiler meat produced within each system.

Results reveal a decline in average production in the ABF system for a given broiler house compared to the conventional system. Compared to broilers produced in a conventional system, birds raised in a single broiler house under ABF conditions will have an annual reduction of between 50,000–100,000 lbs of edible meat (breast, legs, thighs, wings) equivalent to between 265,000–530,000 individual 3 oz. single servings. This loss represents enough to feed 600–1,000 people annually, based on average annual consumption of chicken in the United States in 2012. In order to maintain the same supply of meat under ABF conditions, a typical broiler house will require between 15,000–33,000 more marketed broilers per year.

Due to the additional broilers needed, eliminating antibiotic use has an environmental impact. Compared to a conventional house, chickens raised in a single broiler house under ABF conditions will require between 185,000–390,000 additional lbs. of feed per a year; between forty-two and ninety additional acres a year to produce that feed; between 33,000 and 78,000 additional gallons of water consumed; and between 157,000 and 333,000 additional tons of manure produced. In addition, the cost to produce edible prime meat in a broiler house under ABF conditions is between \$52,000 and \$110,000 per year.

Findings suggest that eliminating the use of antibiotics in the raising of broilers may have a negative effect on the conservation of natural resources as well as a negative economic effect via increased prices to the consumer. Results suggest the need to communicate to consumers the supportive role that prudent, responsible use of antibiotics for animal disease treatment, control, and prevention plays in the sustainable production of broilers.

**Keywords:** antibiotic-free, broiler, chicken, sustainability, environment, economic

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