

***Policies to Prevent Animal Agriculture's Adverse  
Impacts on Public Health and the Environment***

**A Humane Society of the U.S.  
Special Report  
April 2001**

**By:  
Charles M. Benbrook  
Sandpoint, Idaho**

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## **Chapter 1. Executive Summary and Recommendations**

The way farm animals and poultry are raised in America has changed profoundly in the last 30 years. The average size of operation has doubled several times. The density of animals per acre of cropland in the nation's hubs of animal agriculture has gone up more than 10-fold.

Scale and concentration has dramatically changed the economics of the food industry. Changes in the scale of animal feeding operations have been driven by the billions of dollars of outside capital that is flowing into the sector, much of it from the companies, and their investors, that make up today's vertically integrated food chain clusters.

The integrators have become enormous and profitable companies. They have used their size and economic clout in the marketplace to steadily expand their profits and average returns largely at the expense of the farm production sector. Food industry integrators are earning 15 to 30 percent annual rates of return to shareholder equity; most farmers are lucky to earn a 2 percent return in a good year and most commodity program crop farmers owe some three-quarters of their net income to government payments.

The majority of farm animals now raised in America live a part or all their lives on mega-farms. If current trends continue, mega-farms will take over most of the rest of animal agriculture within the next decade. The exceptions will be the cow-calf portion of the beef cattle industry and some portion of dairy production in the Midwest and Northeast.

### **Who Cares?**

Should anyone outside agriculture care about these trends? The answer depends on what people value. Over the last three decades the performance of animal agriculture has generally been judged by measures grounded in economics and scale. Progress has been defined by the falling real cost of a pound of meat or gallon of milk, by the number of animals which a single person can care for, and by how fast a given animal can be brought to market and moved through the system to the consumer.

By these measures the accomplishments of animal agriculture have been impressive, yet these measures do not tell the whole story.

There is a dirty downside to America's high-speed, high-throughput animal systems. Foodborne pathogens of animal origin trigger an estimated 76 million illnesses a year – just from food. Millions more cases occur because of other routes of exposure including drinking water, the air, and direct contact with animals or people who work with and around animals.

The Centers of Disease Control and Prevention (CDC) estimates that illnesses caused by foodborne pathogens are serious enough to lead to the hospitalization of over

380,000 people annually and of those hospitalized, over 7,000 die from the illness or complications made worse by it.

### **Impacts and Costs Avoided can Finance Major System Changes**

The three biggest economic impacts of animal agriculture not reflected in market prices for meat, milk and poultry products are –

- Associated with the costs of illnesses triggered or made worse by foodborne pathogens and/or the slipping efficacy of antibiotics.
- Related to water quality degradation, mostly from manure management systems.
- Triggered by reductions in the value of rural real estate and other property.

Government economists have worked hard in recent years to estimate the direct and indirect costs to society associated with foodborne illnesses from animal products. Their findings are staggering and deserve a more prominent place in animal agriculture policy debates.

The USDA's most recent high-end estimate of the annual costs stemming from just seven food borne pathogens is \$37 billion. These seven pathogens account for only one in 19 illnesses triggered by a foodborne pathogen each year. When USDA completes a comprehensive estimate of costs from foodborne pathogens, the results will surely be several-fold higher than this already shocking estimate. Better information is also needed to project more accurately the multi-billion dollar annual costs associated with slipping antibiotic efficacy, a problem that can also be traced in part to how animals are housed and cared for on American livestock and poultry farms.

Chapter 5 reports our effort to produce more comprehensive estimates of the costs triggered by foodborne pathogens of animal origin and slipping antibiotic efficacy. CDC and USDA data were used as the basis for the estimates. The result for foodborne pathogens – \$39 billion – is much lower than suggested by USDA's current high-end estimates. The additional medical costs triggered by the slipping efficacy of antibiotics are also in the billions annually, as is the share that can probably be prevented by lessened subtherapeutic use of key antibiotics on the farm. Granted, much work is needed to refine these estimates but lack of precision must not mask the compelling need to reduce these impacts in every way possible. And there are many.

USDA studies suggest that at least half the illnesses and costs are avoidable with today's technology. Within just five years perhaps as many as 50 million cases can be prevented – a 75 percent reduction – through a strong commitment to new science and technology, heightened emphasis on animal husbandry systems that promote animal health, and aggressive implementation of promising HACCP (Hazard Analysis Critical Control Point) food safety technologies in meat and poultry processing plants. Annual savings to society would be well over \$30 billion!

Several billion more in annual costs arise from water pollution. No one knows how to quantify in dollars the full range of water quality impacts from animal agriculture. It is particularly hard to place a dollar value on fewer bass caught on a family fishing trips, less diverse aquatic food chains, and shorelines and bays choked with weeds. One can approximate the lost commercial value of the fish that used to be caught in the Gulf of Mexico's "dead zone" but such an estimate captures only a small part of the real value lost when such a vibrant ecosystem is turned largely lifeless.

The odors, bacteria and other problems from large-scale confined animal feeding operations impact tens of millions of acres, perhaps up to 60 million, and the hundreds of thousands of people that live nearby. Lost property values are on the order of \$3 billion and often concentrated in rural counties poorly prepared to deal with the consequences.

This litany of billion dollar costs looms even larger when viewed alongside the costs of preventing or avoiding a significant portion of the costs. As the public learns more about the price they are paying for animal products *after* leaving the supermarket or restaurant, the accomplishments of animal agriculture will be seen in a less flattering light.

### **Solutions are Intertwined**

Many management practices, biosecurity strategies, tricks of the trade, and technologies can and do make a difference at the margins of animal agriculture's impacts on the environment and public health. But for adverse impacts to be reduced by half or more, there must be two fundamental changes in where and how animals are raised.

**Animal densities per acre of cultivated cropland in some regions will have to be reduced, period.** There is no point in pretending that research will lead to solutions in such areas or that stricter regulation will gain a handle on problems. At best new technology and stricter regulation might keep things from getting worse but in all likelihood they will fail even this test all too regularly.

**The prevention of animal disease through the promotion of animal health must become a first among many priorities reshaping animal husbandry systems and animal welfare guidelines.** Animal agriculture is far too reliant on key antibiotics and other drugs. Heavy drug use is driving the emergence of more virulent strains of both old and new pathogens. It is heightening animal vulnerability to new and old diseases, and contributing significantly to the evolution of multiple-antibiotic resistant pathogens, some of which find their way to people, and into hospitals, with frightening regularity.

The solutions to animal agriculture's problems are intertwined. Prevention surely holds the key. Progress in those regions with very high animal densities will depend on spreading animals out across the landscape. This will make needed improvements in manure management systems cheaper and more effective and will also help reduce nutrient and pathogen losses to surface waters.

The separation distances needed between confined animal feeding operations to assure that the crop nutrients in manure can be efficiently recycled should also, in most cases, avoid odor problems and the erosion of rural property values. Manure, odor, pathogens, slipping property values, unhealthy animals, unhealthy working conditions, water pollution. Animal agriculture's problems are intertwined and can only be solved by leveraging progress across multiple goals.

And most essential changes can be largely self-financing, since there is much waste in today's animal production systems that can be avoided and healthier animals are more productive and require fewer veterinary and drug expenditures.

Given these opportunities and the magnitude of today's problems, why is animal agriculture moving ever-rapidly in the wrong direction? It is moving toward bigger and more specialized systems because it is still profitable to do so. **Change in animal agriculture has been and will continue to be driven largely by economics. Policy can help direct change to the extent it shifts economic outcomes.**

The economic forces at work today trace their roots to profound changes in the companies that now dominate the food industry and in how economic and political clout is distributed across the various levels of the food system. The issues that are on top of the public's agenda – reducing the risk of foodborne illness, doing a better job managing manure and protecting water quality -- are on the radar screen of the integrators but well down the list of priorities. This must clearly change and it will take systematic policy reform across several areas, over several years to combat pressures pushing in the opposite direction.

## ***Recommendations***

### **Research and New Data on System Performance**

USDA should commit additional funding for competitive grants focusing on the environmental and food safety performance of alternative animal husbandry systems, with special focus on the impacts of scale of operation and animal density per acre of cultivated cropland in surrounding areas.

New research should encompass a number of baseline indicators of animal health and productivity including the presence and status of enteric pathogens, overall animal and herd health status, drug use, meat and poultry quality, and manure management impacts on water and soil quality.

Grantees should all be asked to use existing and develop improved performance standards and criteria that can be readily monitored over time to track progress or slippage.

The USDA's National Animal Health Monitoring System (NAHMS) should be given more funding to carry out additional surveys like the highly valuable studies completed in the last few years focusing on animal health management and status, drug use, and the prevalence of pathogens.

Congress should direct NAHMS to develop its survey protocols and data collection methods cooperatively with the FDA and the CDC, to assure that the surveys optimally advance the ability of public health scientists to understand, and prevent, the spread of emerging infectious diseases and multiple antibiotic resistant pathogens.

A new initiative is needed to carry out public sector funded, public-sector driven research in meat and poultry processing facilities and food manufacturing plants. The goal should be to push the envelop in implementing and refining HACCP systems, while also documenting the cost-effectiveness of different system innovations. Given the enormous stakes, there should be no shortage of companies that would welcome a chance to cooperate with leading independent scientists in such a program.

If meat processing and food companies shun such a program, more intrusive methods should be adopted to accomplish the same thing. The government absolutely must understand what is happening and why in such plants so that it can help the industry as a whole perfect the science and art of prevention through sophisticated HACCP procedures.

### **Commodity Program Reforms**

Counter-cyclic commodity program provisions should be restored. Farmers raising feed for animals raised on their operation should be exempt from set-aside requirements for several hundred acres.

Such farmers should also be offered higher per bushel or acre payment rates for agreeing to incorporate higher performance standards in their manure management and disease prevention programs.

### **Manure Management**

Over the next five years all confined animal feeding operations (AFOs) should be required to obtain a state or federal site permit and develop and adhere to a nutrient management plan. The right to continue raising animals must be linked to the obligations set forth in the permit and the plan.

Site permits should discourage the placement of facilities, especially manure storage lagoons, over alluvial aquifers or in areas with highly permeable soils. Existing facilities in such areas should be required to carry out frequent monitoring and, when necessary to avoid water quality degradation, should be cut back in size or closed. There should be no apologies or hand wringing over such commonsense requirements.

Government can and should help existing operations work through necessary transitions and should cover some of the cost in properly closing facilities and sealing manure storage lagoons or structures, especially when regulations require such steps to be taken quickly to avoid further problems or to protect especially vulnerable resources.

Manure management systems should be required to meet minimum standards of efficiency in recycling nitrogen to subsequent crops via land application. Each state should set a goal for different animal species, which might logically vary by watershed or animal densities relative to available cropland.

A host of policy tools should be used to move all animal operations toward the applicable minimal standard of efficiency. Bonus payments or incentives should be offered through cost-share programs or other mechanisms to reward farmers willing to incorporate higher standards of performance in their manure management systems.

Over time, that standard should also be raised in order to accommodate more animals in a given area without appreciable environmental quality slippage.

Soil quality performance standards should also be built into nutrient management plans and should avoid soil compaction and excessive buildup of soil phosphorous levels.

Each state and local government entities should seek help from universities and the USDA in determining separation distances between AFOs and rural neighbors or other farms, with the goal of achieving negligible odors at the edge of properties on which manure from an AFO is spread.

Minimum separation distances should be adjusted as a function of both AFO size and local animal densities per acre of cultivated cropland.

### **Food Safety and Public Health**

On large-scale CAFOs, animal health, disease pressure, changes in drug use, and the status of enteric bacteria should be monitored at least twice annually. The federal government's FoodNet program should play an integral role in designing the monitoring protocol, in overseeing compliance, and monitoring the results.

Facility permit conditions should include remedial steps to be taken when monitoring data show that minimal herd health standards are in jeopardy or when there is clear evidence of a new and possibly serious disease problem.

Over three years the FDA should phase out subtherapeutic uses of the approximate dozen antibiotics used extensively in animal agriculture that are also still important in the treatment of human diseases, including drugs that are structurally and biologically similar to drugs doctors now rely on in treating human infections.

Evidence of the emergence of resistant pathogens following any use of animal drugs, in any species, should be grounds for restricting, and if necessary, ending such animal uses of the drugs. Resistance does not just threaten a pharmaceutical company's sales, it threatens the public health and health of other animals, because of the promiscuity of bacteria and their ability to quickly exchange genes conferring resistance to drugs.

### **Moving Ahead**

Fortunately, many of the changes on the ground that will be triggered by these recommendations can be largely financed by more efficient, less wasteful production systems. Farmers and the farm sector will benefit in many ways since animal agriculture's food safety and environmental problems share the same root system. Solutions to one set of problems will leverage progress and cut the costs of solving other problems.

The cost of changing how animals are raised to promote better animal health and lessen drug use might reach a few billion annually for a few years, as new procedures are perfected and new facilities and equipment put into operation. But like every past challenge, the U.S. food system will overcome this one when it becomes a priority to do so. And once achieved, in an ever-more health conscious world, the investment will pay handsome dividends here and abroad. Plus, the benefits will keep piling up year after year, while the costs will stabilize and may well decline.

Perhaps the most costly changes – slowing down line speeds in slaughterhouses by perhaps one-third, cutting down the size of mega-farms, and lessening the geographic concentration of animals in certain counties – would cost just pennies more per pound of meat and poultry produced and processed and would be a bargain at twice the price.

Convincing documentation of the public health consequences of current practices in contrast to alternative systems and technology is in short supply and is a key ingredient needed to speed the pace of change. The USDA, in particular, must take the necessary steps to produce solid data on comparative system performance, measured against a markedly broader set of performance indicators.

USDA also should spend less of its time and political capital reciting the accomplishments of U.S. agriculture and more on highlighting the potential for sizable food safety and environmental gains. Change is hard and always threatens some people and companies, so agents for change must speak up and convince skeptics that the process will be well worth it. This is a job USDA can no longer duck, especially if it wants to retain its current portfolio of program responsibilities.

USDA's overriding mission should be preventing tomorrow's problems. To do so, it must be willing to trace the causes of today's problems back to their roots, where prevention through innovation is feasible and affordable. The public should expect no less from its government on matters so close to home.