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## **ANIMAL HEALTH: THE POTENTIAL ROLE FOR LIVESTOCK DISEASE INSURANCE**

by

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Animal diseases can cause significant production losses and a reduction in livestock receipts. While compensation is provided by the U.S. government in the event of an emergency disease outbreak, that compensation, an indemnity payment, does not cover the other costs that producers incur when their production cycle is interrupted. Those other losses, consequential costs, include business interruption, loss of markets, reduced productivity, increased welfare costs and increased biosecurity compliance costs. The recent Canadian experience with bovine spongiform encephalopathy (BSE, commonly referred to as mad cow disease) demonstrates the significance and magnitude of these other, market related, losses-- most significantly losses in exports.

Federal and state governments have a role to play in minimizing disease risk because animal health has many of the characteristics of a public good. A healthy livestock herd not only provides adequate food but also ensures that zoonotic diseases<sup>1</sup> are not transmitted to humans. Animal health is a public good managed by federal and state governments and by individual producers. Market incentives alone are insufficient to induce adequate supplies of animal health, so federal and state governments intervene to improve the supply of animal health.

The actions taken by the U.S. to safeguard animal health are not readily understood or widely recognized outside of the animal health community. A basic understanding of issues facing livestock disease risk management needs to be communicated to a wider community. In this paper, we give a brief overview of U.S. animal health regulations, the role of the Animal Plant Health Inspection Service (APHIS), and discuss how livestock disease insurance, as supported by the USDA Risk Management Agency (RMA), may help bridge gaps in producer support. This perspective provides an introduction to both public and private economic concerns resulting from disease outbreaks.

### **Review of Animal Health Regulations**

Nine federal regulations define the national government activities<sup>2</sup> in mitigating livestock diseases. Diseases addressed in the regulations include brucellosis, chronic wasting disease, pseudorabies, scrapie, tuberculosis and various foreign animal diseases. Brucellosis, pseudorabies, scrapie and tuberculosis have ongoing federally supported eradication programs that compensate producers for their part in removing those diseases from the national livestock herd. Johne's disease and avian influenza (AI) programs<sup>3</sup> were added recently and the government will concentrate on disease monitoring, surveillance, and eradication. When livestock are depopulated, compensation values are usually determined by appraisal but may be subject to budget constraints or reduced by the amount of

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<sup>1</sup> Zoonotic diseases are those that are transmissible from animals to humans.

<sup>2</sup> The federal government is involved in many different disease management and exclusion activities. This article only concentrates on the parts of federal and state regulations that concern animal disease management and eradication.

<sup>3</sup> Johne's disease and the END regulations are in addition to the nine federal regulations identified when the review was completed in late 2002.

the animal's salvage value. Some programs may also cover cleaning, disinfection, transportation, or disposal, though the amount of this type of compensation is limited.

The total number of state programs relating to animal disease management in 2002 was 119. In the western states, there were 57 regulations addressing animal health and disease management. Many of these programs cover multiple species and/or multiple diseases. Most policies cover cattle, beef and dairy, and the most commonly mentioned disease is tuberculosis. Other diseases specifically mentioned include brucellosis, foot and mouth (FMD), glanders, classical swine fever (CSF; hog cholera) and the generic "contagious diseases" category. Table 1 lists the number of regulations identified in each western state, livestock species covered and diseases covered.

Some western states have regulations with specific disease titles, while other regulations are more general and describe safeguarding and surveillance for animal health. Most regulations are state department of agriculture regulations, though some are administered by marketing orders or industry groups. Western states involved in the federal eradication programs generally have a corresponding regulation that covers the state's role in satisfying federal requirements.

Many of the state animal health regulations specify an appraisal and indemnification system. Often appraisal values are capped at a specific proportion of the total appraised value of the animal (30%, 50%) and only owners of the livestock are eligible for compensation. When diseased animals find a secondary market, i.e. hides or for pet food, that salvage value is subtracted from the total state indemnity. Breeding animals are sometimes mentioned in the regulations and indemnities tend to be higher but vary by state. Funding for the indemnities also varies. Funding for these programs may be appropriated by the legislature; costs may be shared with the county where the disease occurs. Some states require per head assessments (CO) and other states tax producers (IA, KS, MS, MT). None of the western state regulations cover cleaning, disinfection or other costs associated with animal disease mitigation.

### **Opportunity for Insurance in Managing Livestock Disease Risks to Producers**

The discussion above, of federal and state animal disease regulations, demonstrates two significant shortcomings of the current indemnification process. First, producers receive no compensation for consequential losses, the bulk of which are related to business interruption, resulting from a disease outbreak. Business interruption, the inability to produce and market livestock, may occur in livestock production in a number of different ways. Market access may be restricted because of quarantines, because commercial stock has been depopulated, because export markets are closed or because of reduced consumer demand. During BSE outbreaks in Germany and Japan, consumer demand for beef plummeted. Consumer demand was not significantly reduced during Canada's recent BSE outbreak, but export markets were closed to Canadian beef, creating significant oversupply in the domestic marketplace. Consequential losses associated with an animal disease always occur but risk management strategies to deal with their impact are underdeveloped.

The second area of weakness in the western framework for animal disease compensation is the indemnification values for higher valued commercial livestock. Owners of registered, purebred, and rare livestock have access to insurance markets, but many commercial breeding animals or genetically superior commercial livestock are not valuable enough to justify purchasing insurance. These animals receive compensation that may not be sufficient compensation for their higher value compared to other commercial livestock. Another issue related to insufficient indemnification values are pro-rated or capped indemnity payments. The indemnity payments may be capped because of budget constraint or may be capped when the federal indemnification proportion is not matched by a state indemnification. Both undervaluation and limited indemnification values result in producers receiving compensation for their animals that is less than the market value of the animal prior to the disease outbreak.

Table 1: Western States Animal Disease Management Regulations

State	Number of Regulations	Species	Diseases Covered
Alaska	1	Dairy cattle	Unspecified
Arizona	1	Unspecified	Tuberculosis (TB)
California	3	Beef cattle, dairy cattle and unspecified livestock	TB, brucellosis and unspecified diseases
Colorado	3	Captive cervids (deer, elk) and unspecified animals	Brucellosis and other unspecified diseases
Hawaii	4	Beef cattle, dairy cattle, swine	Anaplasmosis, TB, brucellosis, classical swine fever (CSF)
Idaho	4	Beef cattle, dairy cattle, swine, sheep, goats, captive cervids and unspecified animals	FMD, BSE, CWD, other TSEs, TB, brucellosis, pseudorabies
Illinois	3	Swine and unspecified animals	Brucellosis, trichinosis and unspecified diseases
Indiana	1	Unspecified animals	FMD, glanders
Iowa	3	Beef cattle, dairy cattle and unspecified animals	Farcy, anthrax, dourine, FMD, TB, brucellosis
Kansas	4	Swine and unspecified animals	Vesicular exanthema, pseudorabies, FMD and unspecified diseases
Michigan	1	Unspecified	Unspecified
Minnesota	2	Beef cattle, dairy cattle and unspecified animals	TB, brucellosis, paratuberculosis and unspecified diseases
Montana	2	Unspecified animals	Rinderpest, surra, contagious pleurapneumonia, FMD, unspecified diseases
Nebraska	1	Beef cattle, dairy cattle	TB
Nevada	2	Sheep, unspecified animals	FMD and unspecified diseases
New Mexico	1	Unspecified	Rinderpest, farcy, TB, rinderpest, FMD pleurapneumonia, glanders and others
North Dakota	1	Beef cattle, dairy cattle, swine, sheep, goats, captive cervids, equine	Unspecified
Oklahoma	3	Beef cattle, dairy cattle and unspecified animals	Brucellosis and unspecified diseases
Oregon	1	Unspecified	Unspecified
South Dakota	5	Beef cattle, dairy cattle, swine, and unspecified animals	Vesicular exanthema, CSF, brucellosis, TB and unspecified diseases
Texas	1	Unspecified	Unspecified
Utah	1	Unspecified	Unspecified
Washington	1	Unspecified	Unspecified
Wisconsin	5	Beef cattle, dairy cattle, bison, captive cervids, swine and unspecified	CWD, TB, brucellosis, pseudorabies and unspecified diseases
Wyoming	3	Beef cattle, dairy cattle, swine and unspecified animals	TB, Bang's disease, CSF and unspecified diseases

Considering these two state and federal compensation program shortcomings, there is an opportunity for insurance to be developed to assist in the management of livestock disease risks. Following the passage of the Agricultural Risk Protection Act (ARPA) in 2000, RMA has supported the development of livestock revenue insurance policies. The Livestock Risk Protection (LRP) policy was piloted in swine in Iowa in 2002 and extended to feeder and fed cattle in 2003<sup>4</sup>. Other policies, Livestock Gross Margin (LGM), Average Gross Revenue (AGR) and AGR-Lite provide revenue insurance for livestock producers in various states. These products, however, limit the total number of head or the total value of the herd that can be insured. AGR policies do allow for payments resulting from an unavoidable natural disaster and a resulting disease, but other disease mortality is not covered. Additional policies may be developed as RMA continues to support livestock insurance development as mandated in ARPA. Projects are already underway to support insurance development for aquaculture and provide protection for forage and grazing supplies for livestock producers. However, so far no RMA-supported products have been developed that include mortality from disease as a covered peril.

#### **Livestock Risk Protection, Livestock Gross Margin and Adjusted Gross Revenue Insurance**

Two revenue insurance policies for hog producers are currently available, Livestock Risk Protection (LRP) and Livestock Gross Revenue (LGM). In crop year 2004 feeder cattle and fed cattle policies for LRP were introduced across a variety of states. LRP protects livestock producers from a decline in the prices for livestock during the policy term. LGM protects against a decline in gross margin, defined as the value of the livestock minus the feed costs. Both policies use futures markets to establish prices over two six-month periods during one crop year. LGM has a specific closing sales date for each period, while LRP can be purchased anytime during each period. For LRP, 70 to 95 percent of the daily price can be insured while 85 to 100 percent of expected gross margin is insurable with LGM. Both policies limit coverage to relatively small numbers of animals per crop year: LRP Swine, 32,000 head; LRP Fed Cattle, 4,000 head; LRP Feeder Cattle, 2,000 head and LGM 30,000 head of swine.

After the outbreak of bovine spongiform encephalopathy (BSE) in December 2003, the Risk Management Agency (RMA) suspended the sales of LRP for feeder and fed cattle. LRP excludes mortality as a result of disease as a covered peril. Policy holders who did not have diseased animals but suffered the impacts of reduced cattle prices resulting from the market impacts of disease discovery, however, would be eligible for payment. Immediately after the BSE discovery, RMA reported a run on LRP cattle policy purchases and sales were suspended. As of January 29, 2004 sales had not resumed.

Adjusted Gross Revenue (AGR) provides a guaranteed minimum revenue for the insurance period. Multiple commodities are covered in the policy and protection is for natural disasters and market fluctuations. AGR uses the producer's IRS Schedule F tax returns over the most recent five years to establish a base income and then provides supplemental coverage by multiplying the approved AGR by the selected coverage level and payment rate. Purchase of an AGR policy is limited to producers who earn no more than 35 percent of expected income from animals and animal products. AGR-Lite allows coverage levels of 65, 75 or 80 percent and coverage is limited to \$250,000 of liability, all of which can be from livestock production.

*Source: RMA*

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<sup>4</sup> Beginning in the 2004 crop year (November 2003 policy sales begin), LRP will expand beyond IA to the following western states: IL, IN, KS, MN, NE, OK, TX, UT & WY. LRP for fed cattle will be available in IL, IA, NE and for feeder cattle in CO, IA, KS, NE, NV, OK, SD, TX, UT and WY in CY 2004.

As the development of additional livestock insurance programs continues, alternative value and consequential loss insurance could be developed. Alternative value insurance offers a way to address the two shortcomings previously discussed. Alternative value insurance could provide producers the option to insure the value of the animal above the indemnity value received. Development of alternative value insurance can be facilitated by pre-published compensation schedules. Currently, compensation schedules for livestock affected by emergency disease outbreaks are developed at the time of the outbreak. If compensation schedules were published in advance, insurance could then be purchased for the difference between the livestock's market value and the indemnification rate, essentially "topping up" the compensation. Additionally, when indemnity payments are made at a fraction of the appraised value, alternative value insurance can allow producers to insure the difference between the appraised value and the actual indemnity value. These two insurance policies would need to be based on sound actuarial data for RMA to support their development. However, actuarial data related to many diseases does not exist because those diseases have not occurred recently in the U.S.

The second area where insurance can improve the management of disease risk is by covering consequential losses. Consequential loss insurance would allow producers to purchase insurance to offset costs incurred from downtime, reduced productivity and loss of market not covered by government indemnity payments. Other industries already use variants of consequential loss policies, especially for business interruption, that might be adaptable to livestock production.

Evidence from Germany demonstrates that both alternative value and consequential loss policies for livestock producers can be developed and can work in parallel with government indemnity programs. In Germany, indemnity payments are made based on predetermined and published payment schedules (Bätza). These schedules are capped by maximum values that do not represent the value of superior commercial animals. Policies are available to insure the difference between the value indemnified according to the published government schedule and the value of the animal under regular, non-disease market conditions. The leading German agricultural insurer (R+V subsidiary VTG) offers policies to cover consequential losses, including government actions that interrupt trade (lost markets) and reduced reproduction rates.

### **Potential Benefits and Obstacles of Livestock Disease Insurance**

Livestock disease insurance products have the potential to complement current disease management practices. Livestock disease insurance guidelines would require producers to be involved actively in the management of a disease event, minimizing total economic impacts. Livestock disease insurance may also assure lenders that loans are protected in the event of a catastrophic disease event, thereby providing continued access to capital markets for producers.

Although the potential benefits of livestock disease insurance could be significant, challenges exist. Insurance may increase the incentive for producers to commit bad acts (moral hazard), which increases the probability or size of a loss caused by the behavior of the producer (Kunreuther, 2002). Adverse selection, a specific type of moral hazard, would occur in animal production when producers with lax biosecurity choose to insure more frequently than those producers with better biosecurity. Inspections and co-payments are commonly used to protect against moral hazard in insurance and would be necessary when insuring for livestock diseases.

While two types of insurance policies, alternative value and consequential loss, have been discussed in this article as the most easily integrated into the animal disease indemnification schedule, the wording of the Animal Health Protection Act (AHPA) may be a limitation in the near term to the development of livestock disease insurance. The AHPA legislates that indemnity payments must be reduced by any compensation received from any state or other source, i.e., all insurance and indemnity payments

cannot exceed the market value of the animal. This may imply that any insurance payment resulting from animal disease may be deducted from federal indemnification values.

## **Conclusions**

Animal health is a public good managed at the federal and state government and at the individual producer level. Livestock diseases can cause significant losses to agriculture and other industries. Livestock producers are compensated, though not always at market value, for depopulated animals. However, uncompensated consequential losses resulting from an eradication program can be considerable. Recent legislation has made it possible for the USDA-RMA to support the development of insurance for livestock, including disease coverage.

Livestock disease insurance could potentially provide relief to producers for consequential losses and the difference between market and indemnity values (alternative value). Consequential losses, including business interruption, welfare (feeding and care) costs for animals, and loss of markets, are not eligible for current U.S. government indemnification. Also, producers may not receive full market value for their animals because of budgetary limitations. Providing insurance to make up the difference between market value and indemnification value (what the government actually pays based on the market value) and for consequential losses seems to offer the best opportunity for developing livestock disease insurance.

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