S_BRM Overview

Slide 1	Introducción al Manejo de Riesgos Biológicos Para productores de carne de res y lácteos	In this overview presentation, we will introduce the concept of biological risk management (BRM) and discuss how it applies to beef and dairy producers.
Slide 2	**Manejo de Riesgos Biológicos (MRB)** • Proceso general de concientización, evaluación y manejo • Diseñado para mejorar el control de infecciones/ enfermedades – Enfermedades exóticas y endémicas • Proporcionar herramientas para minimizar el riesgo **Zona de Control de Enfermedades Animales** Se prohíbe la entrada a vehículos o bicicletas de uso privado más allá de este punto Está usted a punto de ingresar a una instalación ganadera Bienvenidos visitantes Favor de tomar un folleto donde aparecen descritos los pasos que estamos tomando para proteger su salud y garantizar su seguridad, así como para preservar la salud de nuestro ganado. Center for Food Security and Public Health Iowa State University 2006	Biological risk management is the overall process of awareness education regarding the risk of infectious diseases entering or spreading through an animal facility. It also involves evaluating and managing those risks. BRM is designed to help livestock producers understand the need for infection or disease control, not only for foreign animal disease threats but domestic diseases as well. Biological risk management provides the tools to minimize the risk (photo courtesy of: DB Weddle).
Slide 3	**Manejo de Riesgos Biológicos (MRB)** • No es posible eliminar totalmente el riesgo de enfermedades – El animal, su entorno – Disminuir la exposición a patógenos • Minimizar la amenaza para animales y humanos • No existe una misma respuesta para todos los casos  Center for Food Security and Public Health Iowa State University 2006	BRM recognizes that diseases cannot be eliminated, but that the risk can be managed through effective control measures. As animal caretakers, it is our duty to be knowledgeable of the animal and its environment to minimize the risk of disease. For nearly all diseases there is a relationship between dose exposure and severity of disease. For diseases that are always present (endemic), reducing the dose of infectious agent the animal is exposed to can positively affect the farm's economic impact and help justify the cost of implementing BRM. Many different solutions exist and because all cattle facilities are different, there is not a one-size-fits-all answer. Photo depicts cattle in a pasture and the owner walking through them monitoring for illness (courtesy of USDA, taken by Bill Tarpenning).
Slide 4	**Panorama general** • Importancia del MRB • Percepción y evaluación de riesgos – Vías de transmisión • Planes prácticos de manejo – Prácticas preventivas generales • Una mayor concientización a través de la comunicación Center for Food Security and Public Health Iowa State University 2006	The goal of this presentation is to illustrate the importance of biological risk management (BRM). We will introduce the concepts of risk perception and risk assessment, discuss the various routes of transmission that could introduce disease and provide animal producers/workers with tools to implement practical disease management plans. A review of some general prevention practices will be provided. And finally, this presentation will increase awareness regarding disease introduction and spread through communication.
Slide 5	Importancia del MRB	Let us begin our discussion by addressing the importance of biological risk management.

Slide 6

Importancia del MRB

- Importancia del sector agropecuario
- Prácticas cambiantes en la producción de alimentos
- Aumento de enfermedades infecciosas emergentes y re-emergentes
- Globalización cada vez mayor
- Mayores interacciones con los animales

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Why is biological risk management important? There are several reasons – the importance of the economics of agriculture, changing food production practices, the rise in emerging and re-emerging infectious diseases, increasing globalization and increased human interaction with animals.

Slide 7

El sector agropecuario y la economía

Agriculture is an enormous economic industry. Biological risk management is important in order to minimize the animal health and economic consequences to the nation and agriculture industry should there be an infectious disease outbreak.

Slide 8

El sector agropecuario y la economía

- 1 de cada 6 empleos en EE.UU. está relacionado con la agricultura
- Nuestra economía depende del sector agropecuario
  - Industria ganadera
  - De una u otra manera, afecta a todos en EE.UU.

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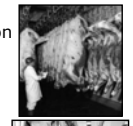
Beyond the scope of working directly in the agriculture industry, it has been stated that one in six jobs in America is related to agriculture. It is understandable then why our economy is heavily dependent on the agriculture sector and within it, the animal production industry. The agriculture industry affects every man, woman, and child in America in some way. The top photo depicts combining corn in South Dakota. Even though all Americans do not work directly in agriculture, we are all affected by the industry in some way, such as buying milk products from the supermarket as the bottom photo depicts (photos source: USDA).

Slide 9

El sector agropecuario y la economía

- El segmento individual más extenso es el de la producción de carne de res
  - 1.4 millones de empleos
  - $188.4 mil millones
  - En los 50 estados
- Industria de productos lácteos
  - 900,000+ empleos
  - $29 mil millones en ingresos familiares
  - Un total de $140 mil millones



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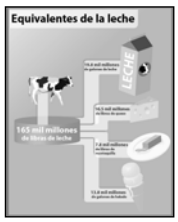
Beef production is the single largest segment of the agricultural industry, accounting for 1.4 million jobs and $188.4 billion dollars of direct and indirect economic activity. Moreover, beef cattle are produced in all 50 states, and thus have an impact on all state and local economies. The top photo depicts one person's involvement in the beef industry, carcass inspection (photo source USDA). The dairy industry also has a significant contribution to the economic impact of agriculture. 2002 estimates 900,000 jobs created $29 billion in household earnings with an overall economic output of $140 billion. Bottom photo depicts two dairy employees working in a milking parlor (photo source USDA - ARS). **Note to presenter: If you have data about your own states beef or dairy production numbers, you could insert a slide after this one to personalize the presentation to your area.**

Slide 10

El sector agropecuario y el MRB

- Proporcionar una fuente segura de alimentos
  - Animales sanos
- La leche proporciona el 73% del calcio contenido en el abastecimiento alimentario de EE.UU.



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One of the cattle industry's main focus areas is a safe food source, which comes from healthy animals. In the dairy industry, milk supplies 73% of the calcium in the U.S. food supply. Using the NAHMS 2001 total milk production of 165 billion pounds of milk, this would translate into a total of 19.8 billion gallons of milk which could be converted into 16.5 billion pounds of cheese, 7.8 billion pounds of butter, or 13.8 billion gallons of ice cream! Instituting biological risk management plans in cattle facilities can help mitigate the economic consequences that could be inflicted by endemic diseases on the farm as well as a new or a foreign animal disease (graphic design by C. May).

Slide 11

El sector agropecuario y el MRB

- Comprender el impacto para la industria
- Proporcionar
  - Ingresos
  - Estilo de vida
- Mitigar las consecuencias económicas de un brote de enfermedad

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It is essential that we realize the impact of agriculture on every person and do everything we can to keep animals healthy and provide an income conducive to a lifestyle in livestock production. Protecting animals from disease through proper hygiene of people and equipment has a direct effect on the agricultural industry. Disease control and working to institute biological risk management plans can help mitigate the economic consequences of a disease outbreak (photo source USDA).

Slide 12

Cambios en la producción de alimentos

Animal agriculture has changed a lot in the past few decades. This presents opportunities to implement BRM plans.

Slide 13

Cambios en la producción de alimentos

- El número de explotaciones agropecuarias disminuye
- El número de animales en las explotaciones agropecuarias aumenta
- Oportunidades
  - Incrementar la intensidad/especialización
  - Fuente eficiente de alimentos:
    - EE.UU. y el mundo
- Desafíos
  - El control y erradicación de enfermedades
  - Los efectos económicos son devastadores

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Each year the Census of Agriculture reports fewer farms, yet strong growth in the number of animals that remain on some of those farms. This intensity in animal production and species specialization has allowed livestock farmers to efficiently provide food for America and the world. Changes in production animal management present opportunities and challenges that were not a part of raising animals only a few decades ago. With new and re-emerging diseases, susceptible animal populations could be located in a fairly small geographic area so that a single cattle disease could have devastating economic effects. The way we raise and interact with animals has drastically changed; so too must our concept of how to prevent disease introduction to continue to ensure the animal's well-being and a safe food source.

Slide 14

Producción de carne de res

- Industria segmentada
  - Las cifras de vacas-becerros permanecen estables con tendencia a incrementar
    - El número de explotaciones agropecuarias permanece estable
    - En su mayoría, pequeñas operaciones (<50 cabezas)
  - Intensidad creciente en los corrales de engorda
    - Menos corrales de engorda con más animales
- Oportunidades y desafíos

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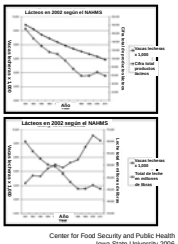
Beef cattle production is a very diverse and segmented industry. Most producers have small operations, particularly on the cow-calf side. Approximately 80% of cow-calf operations own less than 50 head. This often limits the ability to devote significant resources to facilities and management improvement. Feedlots are much larger operations, and as a whole, the feedlot segment is moving toward consolidation. Additionally, feedlots tend to be concentrated in specific geographic areas. Changes in beef cattle management present opportunities and challenges that BRM can help address. The photo shows a large modern feedlot (photo source USDA).

Slide 15

Producción de lácteos

- Las cifras de vacas lactantes y explotaciones están disminuyendo
  - 2001: 9.16 millones de vacas
  - 97,560 operaciones
- Una mayor producción
  - De las vacas y en EE.UU.
  - Mayor intensidad
- Oportunidades y desafíos



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The dairy industry has undergone some very similar changes, as the top graph depicts. Over the past ten years the total number of dairy cows in the U.S. (pink, bottom line) has decreased from about 9.83 million in 1991 to 9.16 million in 2001. During the same time, the total number of dairies (blue, top line) has decreased from 180,640 to 97,560 operations. This amounts to a 46% decrease in dairy operations accompanied by only a 6.8% decrease in milk cow inventories during these 10 years. The bottom graph demonstrates the combined effect of less cows (6.8% - pink, bottom line) accompanied by an increased productivity (20.7% - red, top line) resulting in a total U.S. milk production going from 147,697 million pounds of milk in 1991 to 165,336 million pounds in

2001. This is a net increase of 11.9% of milk being produced. There are fewer dairies which are getting bigger, and each cow is producing more, making our dairy herds more vulnerable to disease introduction or an outbreak. It also means that a breach in BRM will have more costly consequences (NAHMS 2002 data).

Slide 16	El aumento de enfermedades infecciosas emergentes y re-emergentes	Next we will discuss the rise in emerging (newly recognized) and re-emerging (those present previously and reappearing in the same area or a new area or with a new clinical presentation) infectious diseases.
Slide 17	**Enfermedades emergentes y re-emergentes** 	This slide depicts a disease timeline. In the last 25 years, some serious animal and human diseases have emerged or re-emerged. Starting at the bottom in 1982, *E. coli* O157:H7 and Lyme Disease (*Borrelia burgdorferi*) first appeared. Next came the emergence of HIV in the United States in 1983; The first case of Bovine Spongiform Encephalopathy (BSE) was identified in the United Kingdom in 1986; Cat Scratch Fever (*Bartonella henselae*) was recognized in 1992; Hantavirus (Sin Nombre virus) was recognized in the four corners region of the U.S. in 1993. In 1996, variant Creutzfeldt-Jakob Disease (vCJD) appeared in humans in the U.K. Nipah virus emerged in swine and humans in Malaysia in 1998, and West Nile Virus appeared in the United States one year later. In 2003, SARS appeared in humans in Asia and Canada, Monkeypox was transmitted from prairie dogs to humans in the Midwestern U.S and the first case of BSE appeared in the U.S. In 2004, highly pathogenic avian influenza (H5N1) started in East Asia and spread west causing disease and death in poultry, wild birds and humans. The outbreak continued into 2005 and 2006. By preparing for infectious disease outbreaks through awareness, proper planning and control measures, the impact from these new diseases can be greatly reduced (Graphic by Travis Engelhaupt, ISU).
Slide 18	Viajes y comercio a escala global	Increased globalization through travel and commerce has a significant impact on everyday life. We are able to travel anywhere in the world in less time than it takes for a disease to incubate and appear in animals. This increases the importance of biological risk management for everyone.

Slide 19

The increasing global nature of travel and the importation of animals increases the risk of a disease entering the U.S. and disrupting our economy and livelihood. A foreign animal disease, either carried within a food product or on the traveler's person could serve to introduce disease to U.S. animals. Often when we travel abroad, we do not wash our clothes prior to returning to the U.S., so we may be a risk factor for introducing diseases. Additionally, the importation of live cattle and animal products requires strict regulation to minimize the threat of disease introduction. Many infectious diseases can be carried by asymptomatic animals and others may remain viable in animal products for periods of time. In this photo, cattle are going through a tick treatment bath at a USDA APHIS facility in McAllen, Texas (photo source USDA). Finally, the waste or garbage generated on international flights or sea voyages could carry a livestock disease from a foreign country. The USDA APHIS Plant Protection and Quarantine (PPQ) and DHS Customs and Border Patrol (CBP) are responsible for monitoring garbage unloading from the various vessels and airplanes that arrive at approved U.S. ports. All regulated garbage must be placed in sealed, leak proof containers and transported to an APHIS approved facility for incineration to ash, sterilization, or grinding and discharged into an approved sewage system to minimize the spread of disease.

Slide 20

On any given day, over 1.4 million people and over 38,000 animals enter the United States; 500 million people annually (330 million of which are non-citizens). Approximately 730 million people travel on commercial aircraft each year and 11.2 million trucks and 2.2 million rail cars cross into our country annually. Also, 7,500 ships from foreign countries make 51,000 calls in U.S. ports annually. Each of these modes of transportation poses a risk to introducing a foreign animal disease either within a food product carried by a traveler, the garbage generated during travel from products originating in a country with a FAD, or the traveler harboring a disease that could be spread directly or indirectly to U.S. animals. http://www.iaem.com/agricultural_security_and_emer.shtml (graphic by Clint May, ISU).

Slide 21

In fiscal year 2000, 14 million animals were imported into the U.S., primarily from Canada and Mexico. Approximately 40,000 people employed by the Department of Homeland Security have the charge of protecting our 5,525 miles of border with Canada, 1,989 miles with Mexico and 95,000 miles of shoreline from entry of illegal items and those carrying potentially devastating diseases. It is a daunting task and over 2,000,000 agricultural items are intercepted annually at airports alone. Although the DHS and USDA actively conduct surveillance at our borders and ports, it is impossible to screen each traveler or vehicle for exotic diseases. We must all do our part to be aware of diseases and discuss these topics with cattle producers who may travel or send animals overseas for shows or breeding purposes. This information was obtained from the U.S. Department of Homeland Security website at: http://www.dhs.gov/dhspublic/display?theme=50&content=875 (graphic by Clint May, ISU).

Slide 22	Interacción entre humanos y animales	Animals have been a part of human lives for centuries. This interaction strengthens the need for a program like biological risk management to protect the people working in the cattle industry from acquiring a disease.
Slide 23	**Interacción entre humanos y animales** • Los ganaderos trabajan diariamente con animales – La mayoría de ellos se vuelven inmunes a diversas enfermedades • La población inmunodeficiente es más vulnerable a zoonosis – Niños y ancianos – Quimioterapia – Diabetes   Center for Food Security and Public Health Iowa State University 2006	Livestock producers have a lot of contact on a daily basis with animals. In most cases associated with infectious diseases, the farmer has been previously exposed and has developed some type of immunity to it. This is not the case with foreign animal diseases or if their health becomes compromised because normal diseases could make them ill. This immunocompromised population is more vulnerable to zoonotic diseases, those spread from animals to humans. Immunocompromised individuals include the elderly, children under the age of 5, pregnant women, chemotherapy patients, organ transplant recipients, persons with HIV/AIDS, and people with chronic diseases such as diabetes. This makes disease awareness imperative. The top photo shows an elderly farmer, while the bottom photo shows another susceptible population, an immunocompromised person in a nursing home (photo sources USDA).
Slide 24	Realización de una evaluación de MRB en una instalación ganadera	Now that we have discussed the importance of BRM, let's learn about the components of conducting a BRM livestock facility assessment.
Slide 25	**Componentes del MRB** • Percepción del riesgo • Evaluación del riesgo – Vías de transmisión • Manejo del riesgo • Comunicación del riesgo  Center for Food Security and Public Health Iowa State University 2006	The concept of biological risk management involves multiple components. Before a sound, applicable program for an operation can be established, it is important to first understand what the producer's perception of risk really is. After risk perception is understood, risk assessment, based on the routes of disease transmission, can begin. Once the risks are identified, risk management can begin. To be successful, the BRM plan must be communicated to all involved. Photo depicts cattle in a feedlot (photo source link: http://www.watkinsandco.com.au/livestock/livestock_photos/sale18-6-02.jpg).
Slide 26	**La percepción del riesgo** • Diferentes percepciones del riesgo – Primero, identificar qué es lo que se percibe como una amenaza • Factores que influyen en la percepción – La experiencia previa – Los medios de comunicación – El entorno • La aceptación y la tolerancia varían  Center for Food Security and Public Health Iowa State University 2006	Risk means different things to different people. It is imperative to first identify what those involved with the operation think about the real and potential risks of infectious and zoonotic diseases. The public often relies heavily on previous experience, the media, and their environment. What risks are deemed acceptable or tolerable also varies between individuals. The inset photo demonstrates the attention directed toward the first US case of BSE in 2003 (source CNN).

Slide 27

La percepción del riesgo

- Creencias comunes
  - "Siempre lo hemos hecho de esta manera"
  - "He tenido casi de todo en esta explotación"
  - "Cuesta demasiado"
- Nuevas creencias
  - Los brotes de enfermedades pueden suceder y de hecho suceden
  - La prevención es menos costosa que el tratamiento
  - Mucho dinero se ha invertido como para perderlo
  - Prevención a través de la concientización y del manejo

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This is also the period where one may encounter many of the obstacles and challenges to educating about risk management. Common negative beliefs include: "I already know this stuff", "We have always done it this way", "I've already had most everything on this farm", "I don't have enough time to mess with this", "It's too expensive", and "Our animals were tested once and we found nothing, it was just a waste of money". While it is difficult to prove and measure the benefit of things that **don't** happen, counter-arguments tend to fall into three categories: there is a risk, it is economically worthwhile to prepare, and the overall impact must be considered. Some beliefs that may require a change of mindset include: "Infectious/zoonotic disease outbreaks can and do happen", "Prevention is less costly than treatment", "Protecting your financial investment and your future assets from liability is worthwhile insurance" and of increasing importance is the "Prevention of disease through awareness and management".

Slide 28

La evaluación del riesgo

- Evaluación objetiva
- Identificar las fortalezas, debilidades
  - Cambia con el tiempo
- Predecir enfermedades es complicado
  - No así los riesgos subyacentes de enfermedades
  - Lo que influye en la vulnerabilidad de los bovinos es
    - Limpieza, estrés, nutrición
    - Cosas que pueden manejarse

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After an understanding of risk perception has been established, the risk assessment can begin. This provides an objective look at the operation to evaluate the various strengths and weaknesses related to a disease entering and spreading. Risk assessments can change over time depending on the situation at hand. There will be challenges, but this is the first step in the right direction. It is important to remember that living systems are variable and predicting illness or disease can be a complex series of conditional events. Disease predictions are not as simple as yes or no, but the various risks that predispose to disease development often are. Cattle's vulnerability to disease is influenced by cleanliness, stress, nutrition, and other management factors; these are all aspects that can be managed. Photo shows a veterinarian with the manager and owner of a dairy facility having a group discussion at the farm site (photo source USDA – ARS).

Slide 29

Vías de transmisión

In order to perform the risk assessment, it is important to examine how diseases can be acquired and transmitted.

Slide 30

Vías de transmisión

- Atañen a todos los agentes infecciosos
- El animal tiene que estar expuesto para contraer la enfermedad
- Comprender las distintas vías de transmisión = obtener el control
- Es necesario identificar las áreas de riesgo
  - Diseñar protocolos para minimizar la exposición

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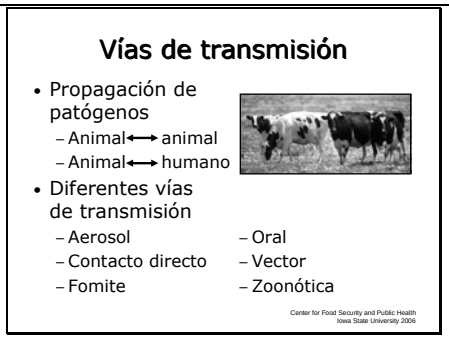
Every disease has to enter into an animal by some route, so looking at disease prevention through the routes of transmission makes sense. One advantage to this approach is that it will also help protect against new or unexpected infectious diseases. This classification system is effective and easy to understand without requiring knowledge about a wide range of diseases, like all those listed at the beginning of this presentation. While disease agents and the infections they produce vary, they all have one thing in common: the animal must be exposed to them to develop disease. Once it is understood that different diseases can be acquired orally and others are breathed in via aerosol transmission, it is easier to gain control over them. From a management standpoint, it may be easier to identify risk areas, such as fomites, and then design protocols to minimize exposure.

Slide 31



Disease agents can be spread from animal to animal, or animal to human, through a variety of transmission routes. For the purposes of the biological risk management materials, 5 main routes were identified: aerosol, direct contact, fomite, oral and rector-borne. The sixth route, zoonotic, can be spread from animals to humans through one of the 5 previously listed routes. Many infectious agents can be transmitted by more than one route of infection. This photo shows several dairy cows grazing in a pasture (photo source USDA – ARS).

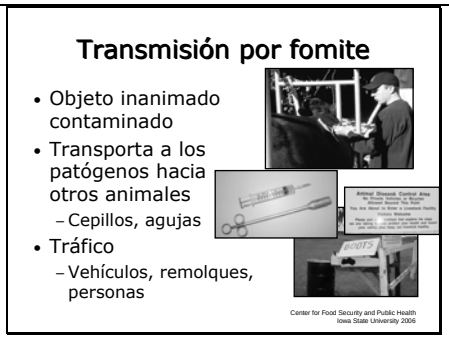
Slide 32

Aerosol transmission occurs when disease agents contained in droplets are passed through the air from one animal to another, or animal to human. Most pathogenic agents do not survive for extended periods of time within the aerosol droplets, and as a result, close proximity of infected and susceptible animals is required for disease transmission. Top photo depicts a tunnel ventilated dairy building; aerosol transmission is of concern if not properly ventilated (photo source DB Weddle). The bottom photo shows a situation where cattle are always in close proximity to one another- a feedlot (photo source USDA).

Slide 33

Transmission by **direct contact** requires the presence of an agent or organism in the environment or within an infected animal. A susceptible animal becomes exposed when the agent directly touches open wounds, mucous membranes, or the skin through blood, saliva, nose to nose contact, rubbing or biting. It is important to note that depending on the disease agent, it is possible for direct contact transmission to occur between animals of different species as well as to humans. For the purposes of the BRM information, **reproductive** transmission will encompass those diseases spread through venereal and in-utero routes. **Venereal transmission (breeding)**, a type of direct contact, is the spread of pathogenic agents from animal to animal through breeding. **In-utero (dam to offspring)** transmission, another type of direct contact, is the spread of pathogenic agents from dam to offspring during gestation. The top photo shows a group of calves together in a pen with ample opportunities for direct contact transmission (photo source DB Weddle, ISU). The bottom photo shows a young heifer licking her newborn calf (photo source USDA).

Slide 34



A **fomite** is an inanimate object that can carry disease agents from one susceptible animal to another. Examples of fomites include contaminated brushes, clippers, needles, balling guns (middle picture; photo source DB Weddle) clothing, milking units, teat dip cups, feed or water buckets, and shovels. The top photo depicts a situation in which disease transmission may occur via a fomite, grooming equipment; (photo source USDA). **Traffic transmission** is another special type of fomite transmission in which a vehicle, trailer, or human spreads organic material to another location. The bottom photos show the entrance to a dairy with a sign stating the premise's visitor restrictions, as well as a handy place for boot distribution and collection at the entrance to the farm (photos source DB Weddle).

Slide 35

Transmisión por vía oral

- Consumo de alimento o agua contaminados
  - Excremento, orina, saliva
  - Otros contaminantes (proteína de rumiantes)
- Lamer/masticar ambientes contaminados

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Pathogenic agents can also be transmitted to animals or humans **orally** through consumption of contaminated feed, water or licking/chewing on contaminated environmental objects. Feed and water contaminated with feces, urine or saliva are frequently the cause of oral transmission of disease agents. However, feed and water can be contaminated with other infectious agents as well such as ruminant protein in ruminant feed. The top photo depicts a Holstein and an Ayrshire drinking from different sides of a water tank- if it becomes contaminated, all of the animals in those pens could be exposed (photo courtesy of DB Weddle, ISU). The bottom depicts Hereford calves eating silage at a wooden feed bunk, a potential source of bird, rodent, or dog contamination (photo source USDA).

Slide 36

Transmisión por vector

- Un insecto
- Adquiere el patógeno a partir de un animal
- Lo transmite a otro animal
  - Vectores biológicos
    - Pulgas, garrapatas, mosquitos
  - Vectores mecánicos
    - Moscas, cucarachas

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Vector-borne transmission occurs when an insect acquires a pathogen from one animal and transmits it to another. Fleas, ticks, and mosquitoes are common biological vectors of disease, and flies and cockroaches are a common mechanical vector. The top photo shows a calf with two old insecticide ear tags and numerous face flies, while the bottom photo shows an adult deer tick, *Ixodes scapularis* that spreads Lyme disease (photo source USDA).

Slide 37

Contaminación ambiental

- El organismo de la enfermedad en el medio ambiente
  - Sobrevive en el suelo, en material orgánico
- Los animales y las personas pueden adquirir el(los) patógenos(s) a través de
  - Inhalación
  - Contacto directo
  - Fomites
  - Consumo oral
  - Vectores

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Many disease agents can survive for extended periods of time in soil or other organic material like bedding, old feed, etc. Animals or humans can then acquire the disease agent from the environment through inhalation or aerosolization, oral consumption, direct contact, or via fomites as discussed in previous slides. Therefore, **environmental contamination** should not be ignored but recognize the routes it uses to get into the animal can be controlled. This photo demonstrates the wide realm of environmental contamination possibilities (photo source DB Weddle).

Slide 38

Transmisión de la enfermedad

- Es posible que los animales no muestren signos evidentes de la enfermedad
- El conocimiento de todas las vías de transmisión es esencial
  - Formular una estrategia que minimice el riesgo de enfermedad en la operación ganadera

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It is important to remember that disease transmission can occur without animals exhibiting obvious signs of disease. That is why awareness of the various routes of transmission becomes so essential when assessing and developing a strategy to minimize the risk of disease for a facility or operation. The photo shows a calf lying in a pasture (photo source USDA).

Slide 39

El plan de manejo de riesgos

Once a facility has been assessed, it is now essential to develop a management plan.

Slide 40

El manejo de riesgos

- Las instalaciones, operaciones evaluadas
  - Se identifican los desafíos
- Plan de manejo a la medida
- Dar prioridad a
  - Lo que sea fácil de implementar
  - Sea barato pero rinda frutos
- No existe una fórmula común

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Once a facility or operation has been evaluated, the challenges to implementing a successful BRM plan can be identified. Only then can a tailored management plan be proposed and implemented. When first working on change, prioritize those items that are relatively easy to implement, inexpensive, yet yield rewards. There is no common formula for what that entails, and rewards will be different for everyone. Simply reducing exposure could be beneficial. The photo shows a large feedlot in Texas (photo source DB Weddle).

Slide 41

El manejo de riesgos

- El plan de manejo refleja
  - Los desafíos inmediatos
  - Las metas de corto plazo
  - Las metas de largo plazo
- Existen diversas soluciones posibles
- Permanecer abiertos a sugerencias
  - Las recomendaciones varían con base en la experiencia y conocimiento del individuo

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Just like the risk assessment is a living document, the management plan should be modeled to reflect immediate challenges, short and long-term goals (as illustrated by the calendar- source DB Weddle). The full BRM assessment program available on-line includes a number of possible implementation strategies for each of the areas for improvement identified. Just as the question set is not 100% comprehensive, these are possible solutions, realizing many more exist. Everyone should remain open to suggestion and realize that recommendations can vary between individuals for the same facility, based on the reviewer's experience and knowledge.

Slide 42

Pasos preventivos generales

Panorama general
- Perímetro de la explotación agropecuaria
- Identificación de los animales
- Salud animal
- Animales enfermos/muertos
- Aislamiento/cuarentena
- Administración del abastecimiento
- Manejo neonatal

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There are many general prevention steps that every farm could implement that would help prevent against a variety of diseases that are transmitted in various ways. Things such as knowing what is in the area of your farm perimeter- farms, neighboring livestock, wildlife; individual animal identification, animal health protocols, recognizing and dealing with sick and dead animals, isolation/quarantine, supply handling, and neonatal management. This next section will provide some general prevention recommendations for those areas. **Note to presenter:** This next section will review general prevention practices; this is where you could hand out the *General Prevention Practices* document and *Checklist* to the audience and have them follow along. The checklist can be taken home so they can evaluate their own operation.

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Pasos preventivos generales

- Restrinjan el contacto con animales como
  - El ganado vecino
  - Fauna silvestre, aves
  - Perros, gatos que deambulan
- Den mantenimiento a las cercas
- Establezcan protocolos de bioseguridad para vehículos de reparto, del personal
- Cierren con llave las entradas

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Limit contact with animals that may present a disease risk by coordinating with your neighbors to avoid fence line contact between herds. Prevent cats and dogs from roaming between farms. By maintaining fences (repairing/replacing posts, tightening wires), you minimize the risk of animals escaping, or other animals entering, and mixing with other livestock or wildlife species, which increases their risk of disease exposure. You should establish biosecurity protocols for delivery vehicles and personnel to follow on your farm. Gates are installed as a barrier to human entry and should be locked to prevent animal contact and subsequent disease exposure. Photo courtesy of Bryan Buss, ISU.

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Pasos preventivos generales

- Identifiquen individualmente a los animales
- Importante para
  - Comunicar su estado de salud
  - Las necesidades de tratamiento
  - La ubicación dentro de la explotación lechera
  - Llevar registros

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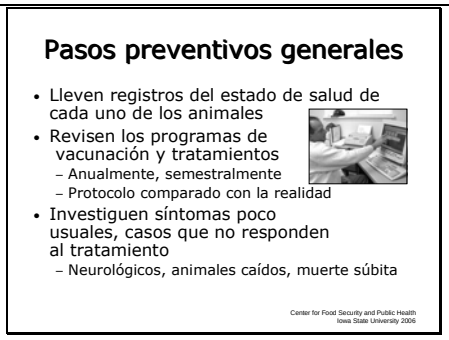
If more than one person works on an operation, individual animal identification is imperative for proper communication of health status, treatment needs, antibiotic withdrawal/residue prevention status, and location on farm. Individual animal identification is essential for proper record keeping (vaccinations, treatments, pregnancy status) which is an integral part of managing animals and minimizing disease risk on farm. Keeping treatment records on a dairy is an integral part of minimizing disease risk on farm because protocols can be tracked over time with your veterinarian and used to determine whether things are working in various disease situations. If these black Angus heifers did not have

identification tags in their ears, it would be hard to communicate health status to someone else because they all look alike (photo courtesy of DB Weddle, ISU).

Slide 45



To monitor health status, it is imperative to keep health records on every animal. There are many computer programs out there that can simplify this for producers as the photo depicts (courtesy of Dale Moore, UC Davis VMTRC). It is important to work with your veterinarian to review treatment and vaccination records so alterations can be made to the animal health protocols on farm; this will also help ensure what you think is happening is actually happening. Producers should work with their veterinarian to investigate those animals that present with unusual symptoms or are unresponsive to treatment, especially neurologic cases, downers and those that die suddenly.

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By establishing and educating all employees on what to look for regarding sick animals and having a reporting system so that those in charge can make treatment decisions or the veterinarian can be contacted, serious diseases can be identified early on and minimize the risk of disease spread. It is important to clean any equipment, boots or clothing that is used between groups of animals with differing health status. Animals that are not going to recover can serve as a reservoir for many disease organisms and should be euthanized humanely and in a timely manner. Dead animals can also serve as a reservoir for many disease organisms and should be promptly removed from the operation. Dead animals need to be rendered, composted or buried in a timely manner so predators, wild birds, etc do not spread disease. By having a veterinarian necropsy animals that die of undetermined causes, a diagnosis may be obtained by sending samples into a diagnostic laboratory. Unusual diseases may not present in a manner you are used to, so involving a veterinarian may help identify a potentially infectious disease before it becomes widespread on your facility. Photo depicts an Ayrshire calf being necropsied and samples being collected for diagnostic testing (courtesy of UC Davis VMTRC).

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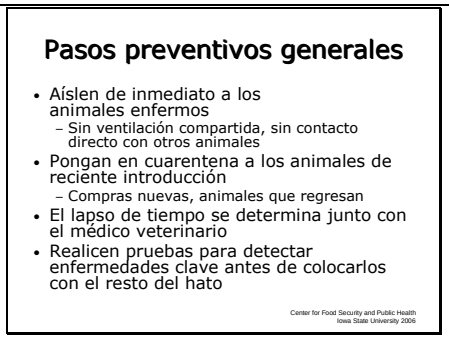

Cattle of all ages that are identified as ill should be removed from the rest of the herd immediately and placed in an isolation area where ventilation, feed/water, and other equipment and is not shared and direct contact with other animals does not occur in order to minimize the risk of disease spread. Newly introduced animals, including show cattle/calves that have been away from the farm as pictured here, may be carrying diseases that your home herd is not immune to, so quarantine them for a period of time. Time spent in isolation and quarantine varies depending on the risk so this should be determined together with your herd veterinarian. Before taking animals out of isolation or quarantine, it is a good risk management plan to test them for key diseases (determined together with your herd veterinarian) and make sure they are not carrying diseases that could be introduced into the home herd.

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Pasos preventivos generales

- Almacenen las vacunas y antibióticos que no requieren refrigeración fuera de la luz de sol ya que ésta podría desactivarlos
- Monitoreen mensualmente la temperatura de refrigeración
  - Temperatura ideal 36-46ºF
- Restrinjan el acceso a las medicinas para que solo lo tenga el personal debidamente capacitado

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Sunlight can deactivate vaccines resulting in inadequate protection; it can also reduce effective treatment by rendering antibiotics ineffective. Vaccines and medicines that need to be refrigerated are susceptible to changes in temperature and may not be effective if they get too warm (greater than 46 degrees Fahrenheit) or too cold/frozen (less than 36 degrees Fahrenheit); monitoring your refrigerator at least monthly can help ensure the products are adequately stored. Work with your veterinarian to teach proper handling procedures to all people who routinely deal with vaccines and medicine and restrict access to only trained personnel. The photo depicts a refrigerator on a dairy farm with a thermometer- purchased for less than $3 at a large retail store (photo courtesy of DB Weddle, ISU).

Slide 49

Pasos preventivos generales

- Garanticen la ingestión adecuada de calostro libre de enfermedades durante las 6 primeras horas de vida
- Eviten el contacto con animales mayores, ambientes contaminados

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Adequate ingestion of colostrum is the most important consideration for calf's resistance to disease and all calves should receive colostrum within 6 hours of birth. A calf's immune system depends on the antibodies in colostrum. After 6 hours of life, the calf's ability to absorb antibodies from colostrum diminishes. Once a calf is born, subsequent milk production in the cow will dilute colostrum and therefore require the calf to consume more for maximum antibody absorption and immune function. Another good practice is to prevent contact of the neonate with older animals and also contaminated environments. This will decrease the pathogen load to the newborn and give the colostrum the ability to provide protection. The photo depicts colostrum in a freezer that is stored in palpation sleeves (with the fingers tied off), labeled with the cow ID number and dated. This allows for easy thawing and making sure the calf gets colostrum from one cow (photo courtesy of DB Weddle).

Slide 50

La comunicación de los riesgos

- ¡La comunicación es fundamental!
- Para ser eficaz, el plan debe ser entendido y apoyado por todos los involucrados
- El éxito de un plan depende de
  - Cómo se lleva a cabo el plan
  - Quién es responsable de los cambios
  - Su incorporación a las actividades diarias

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The cornerstone of the biological risk management plan is effective communication of risk with all those involved. A good plan, poorly communicated will benefit no one. A program must be understood and supported by everyone in order to be effectively implemented. The success of the plan lies in how it can be carried out, who is responsible for making changes happen and incorporation into daily activities. This photo is of a sign reminding visitors to wash their hands after petting the animals both in English and Spanish (photo source DB Weddle).

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Conclusión

In conclusion, let us review some key learning objectives that were discussed throughout this overview regarding biological risk management.

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Objetivos clave de aprendizaje

- El manejo de riesgos biológicos es importante
- Todas las enfermedades se transmiten a través de unas cuantas vías comunes
- Los riesgos de enfermedad pueden manejarse
- La concientización es esencial
- ¡Ustedes desempeñan una función esencial!

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Throughout this presentation, we have stressed that biological risk management is important. All diseases are transmitted by a few common routes and by managing disease exposure, the level of disease will decrease. While disease risk cannot be completely eliminated, it can be managed. Awareness education is essential for effective disease control and each of YOU play a critical role!

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Agradecimientos

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Agradecimientos

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