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# The use of comprehensive management systems to effectively manage environmental and animal welfare within today's swine industry: Use of third-party verification

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## Introduction

Today's modern swine production operations require sound management and orderly approaches to successfully manage their environmental and animal welfare affairs. Not only are certain measures required by law, but it's the right thing to do and enhances the reputation of all swine producers.

Now, more than ever, it is critically important that producers maintain and promote their reputations by engaging in sound stewardship activities. To that end, more and more swine producers are using management systems as a tool to help them maintain the highest environmental and animal welfare standards in their operations. And increasingly they are relying on third-party verification to validate the credibility of their systems.

In order to more clearly explain the effectiveness and potential benefits of comprehensive management systems I will offer the Murphy-Brown experience as an example. Murphy-Brown is the livestock production subsidiary of Smithfield Foods, Inc.

We are the largest hog producer in the world with approximately 835,000 sows currently in production worldwide. Murphy-Brown grows hogs in 13 states in the U. S. and has international operations in Mexico, Brazil, Poland and Romania. We also produce approximately 10 million turkeys annually through our Carroll's Turkeys division.

Beginning in February of 1997, Murphy-Brown made the commitment to develop and implement a comprehensive Environmental Management System (EMS) that would meet all the requirements to become certified under International Organization for Standardization (ISO) 14001 Standards.

After several years of implementation, in 2001 Murphy-Brown became the world's first livestock operation to have an ISO 14001-certified EMS.

Why did we choose to do such a thing and why did we need third-party verification?

Many reasons, but first recognize that Murphy-Brown is a large organization with production facilities in many different locations and must operate under multiple sets

of regulations. Our goal is 100 percent compliance with all applicable regulations 100 percent of the time. We knew we needed a different kind of tool to help us achieve this objective.

Secondly, like all producers, we exist in a world of change; agriculture is changing and will continue to change. Our survival and sustainability depend on meeting the demands and expectations of our customers and the public with regard to environmental stewardship and responsible animal husbandry. Our customers and the public are asking for proof that we conduct our activities in a socially responsible manner.

We also realize that some environmental and animal welfare activist organizations have a clear agenda that runs counter to modern livestock farming. And because of Murphy-Brown's leadership position in the industry we are a highly visible target for activist organizations.

We determined that we not only needed clearly defined and formal systems to address these issues, but we also needed third-party verification of our management systems to demonstrate, through objective evidence, that we were managing our affairs in a responsible fashion.

Once we decided to pursue formalized management systems, we began to look at how they should be constructed. The gold standard for management systems is set by the International Organization for Standardization. ISO defines such systems as: "A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives. A management system includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources."

The ISO management system approach is based on the Plan-Do-Check-Act methodology, which we used as the foundation for our EMS.

- Plan: Decide what it is that you wish to accomplish and establish the processes necessary to deliver the desired results.
- Do: Implement the processes.
- Check: Monitor and measure those processes against your established objectives and report the results.

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- Act: Take actions to continually improve performance of the management system.

Today I will focus my discussion on the EMS and the Animal Welfare Management System (AWMS) that Murphy-Brown developed and implemented on all its U.S. livestock operations, and how we go about validating that our systems work.

## **Environmental Management System (EMS)**

An EMS is a program for producers that provides an organized approach to identify and manage those parts of a swine operation's activities that could affect the environment.

Typically, the scope of an EMS includes such farm activities as feeding, clean-up, lagoon management and spray irrigation.

As a management tool, an EMS includes formalized processes and procedures to manage the environmental aspects of an operation in an organized manner. Our EMS has three main commitments:

- 1 Preventing pollution of any kind.
- 2 Ensuring compliance with applicable regulations.
- 3 Improving the system continuously.

An EMS brings value to the operation by:

- Managing environmental affairs in a better manner;
- Making it easier to comply with regulations;
- Developing methods for continual improvement;
- Preventing pollution; and
- Protecting the environment.

Producers everywhere are faced today with a complex set of environmental regulations, and no single set of instructions can provide explicit guidance for every situation involving environmental issues. But an EMS is an excellent tool that can bring order to the task of environmental management. An EMS can assure that producers have a rational and orderly method of applying good judgment, along with sound management practices, to the task of preventing pollution and protecting the environment.

## **What we have learned**

So what did we learn as we embarked on this process?

First, an organization must be committed to meeting the established standard and providing the human and other resources necessary for success. There must be some set of established standards to which the organization sub-

scribes and against which your management system can be measured.

Second, we realized that a sound management system must be based on things that are measurable—you cannot manage with any degree of certainty that which you cannot measure. To this end we knew we had to develop methods to measure the performance of the system. We also use collected data to assess performance, identify non-conformances, and take corrective actions. We realized that we had to identify exactly what we were measuring and managing. We call these significant aspects. (See **Tables 1 and 2.**)

Third, people are a critical part of any management system. They must go through orientation and training, and fully understand the organization's commitment to sound stewardship. Employees should be assigned specific responsibilities and be held accountable to carry out those responsibilities.

Fourth, it's crucial to the credibility of the system to identify a third party to conduct periodic audits and assessments of system performance. We use the audit results to identify areas in need of improvement and to serve as a road map toward our ultimate goal of continual improvement.

Our EMS includes a systematic method of ensuring ongoing compliance through a series of:

- Inspections
- Internal and external audits of the EMS system, including unannounced audits by third parties
- Identification of non-conformances
- Corrective action measures
- Timely management review

EMS certification is not a one-time achievement but a continual process that requires ongoing diligence to remain in good standing.

## **Producer EMS tool**

Fortunately, having an EMS in place is not just limited to large operations such as Murphy-Brown. To help fellow producers better manage the environmental aspects of their farms, Murphy-Brown and the state of North Carolina teamed up in 2004 to develop an EMS tool that producers anywhere in the United States can obtain free of charge. This tool is similar to the ISO-certified EMS developed by Murphy-Brown for all of our U.S. livestock operations.

The EMS template can be easily customized by individual producers to incorporate unique characteristics of their operations. The materials developed by Murphy-Brown and the state of North Carolina provide a simple, step-by-

Table 1: Significant EMS aspects linked with respective operational controls.

<b>Activities</b>	<b>Significant aspect</b>	<b>Controlled work practices</b>	<b>Operational control<sup>A</sup></b>
Crop Production/Land Management	Crop Management	1. Adequate land 2. Proper crops 3. Harvesting	CAWMP (Waste Utilization Plan) Integrated Land Mgmt Plan
Housing the Animals and Transportation of Animals	Farm Mortality Mgmt	1. Proper mortality disposal	CAWMP (BMP's – Mortality), Trainer's Guide
Nutrient Application	Hydraulic Load	1. Application rate 2. Soil condition	CAWMP (Waste Utilization Plan), applicator training
Nutrient Storage (lagoon)	Influence on/of groundwater (seepage)	1. Land application	CAWMP (Waste Utilization Plan, Lagoon Design and Approval)
Nutrient Application Facilities and Equipment	Irrigation System Integrity	1. Land application 2. Pumps and equipment	CAWMP, Calibration Records
Nutrient Storage (lagoon)	Lagoon Liquid Level Mgmt	1. Lagoon marker 2. Visual checks	CAWMP (Certificate of Coverage and Lagoon Design and O & M Plan), Farm Mgr's Daily/Weekly Inspection Checklist, Wkly Nutrient Mgmt System Inspection Report, Internal Farm Audit
Nutrient Collection/Recycle System	Manure Handling System	1. Recycling 2. Flush system 3. Pit recharge	Farm Mgr's Daily/Weekly Inspection Checklist
Nutrient Application	Nutrient Load	1. Land application 2. Crop selection and management	CAWMP (Waste Utilization Plan)
Housing the Animals and Nutrient Storage (lagoon)	Odor	1. Farm siting 2. Buffers 3. Waste application 4. Lagoon design 5. Housekeeping (cleaning)	CAWMP (BMP's – Odor, Lagoon Design), Trainer's Guide
Nutrient Storage (lagoon)	Sludge Accumulation	1. Lagoon management	CAWMP (BMP's – Odor, Lagoon Design), Internal Farm Audit
Nutrient Storage (lagoon)	Lift Station	1. Recycling 2. Flush system 3. Pit recharge 4. Visual checks	Farm Mgr's Daily/Weekly Inspection Checklist
Miscellaneous	Fuel/Oil Spills	1. Visual checks	Secondary Containment Structures SPCC Plans
Housing the Animals	Facility Structure	1. Visual checks	Farm Mgr's Daily/Weekly Inspection Checklist
Nutrient Storage (lagoon)	Structural Integrity (design & maint.)	1. Operating and maintaining lagoon	CAWMP (O & M Plan), Weekly Nutrient Mgmt System Inspection Report, NRCS Technical Guide
Feeding/Nurturing Animals	Water Usage	1. Watering animals 2. Washing houses	Trainer's Guide, CAWMP (wash water)

<sup>A</sup>Note: Refer to "Document Control" for location and owner.

Table 2: Significant animal welfare aspects linked with respective operational controls.

Activities	Significant aspect	Controlled work practices	Procedures
Providing shelter that is designed, maintained, and operated to provide a physical environment that meets the animals' needs	Air quality in building	Visual check	Production manual (Ventilation Management-all chapters)
	Temperature in building	Daily recording	Production manual (Ventilation Management-all chapters), Ventilation Charts
	Space allowance in building	Visual check	Pork Industry Handbook, House Capacity File
	Protection from elements	Visual check	Pork Industry Handbook
	Power failure (building)	Weekly check	Production manual (Emergency Check-all chapters), Weekly Emergency Generator Checklist, Hurricane Preparedness Protocols, Farm Managers Daily/Weekly Checklist
	Vehicle breakdown	Driver's inspection	Driver Handbook (Accident Scene Procedures for Drivers)
	Temperature during transport	Visual Check	TQA Program, Driver Handbook
	Space allowance during transport (crowding)	Visual check	TQA Program, Pork Industry Handbook
Providing access to adequate water and high quality feed to meet animal nutritional requirements	Water availability (on farm)	Visual check	Production manual (Feeding and Watering-all chapters), Serviceman's Field Report
	Feed availability (feeder adjustment, emergency outs, bin management)	Visual check	Production manual (Feeding and Watering-all chapters)
	Sow's body condition	Visual check	Production manual (Feeding and Watering-all chapters)
Providing humane treatment of swine that enhances their well-being and complies with all applicable laws and regulations	Animal movement on farm (prodding, cutting boards, etc.)	Visual check	Production manual (Animal Movement-General Chapter, Boar Management-Breeding & Gestation Chapter, Preparing the Sow for Farrowing-Farrowing Chapter, Pig Sales-Nursery and Finishing Chapters)
	Surgical procedures	Visual check	Production manual (Piglet Processing & Rupture Repair Procedure-Farrowing Chapter, Castration and Rupture Repair Procedure-Nursery Chapter)
	Biosecurity (preventing exposure to health risks)	Visual check	Production manual (Minimal Disease Procedures and Sanitation), Driver Handbook, TQA Program, Serviceman's Field Report
	Loading/unloading animals for transport	Visual check	TQA Program, Production manual (Shipping and Receiving Animals-General chapter, Pig Sales-Nursery and Finishing chapters)
	Human/animal interaction (on farm)	Visual check	Production manual (Animal Treatment-General Chapter)
Providing identification and appropriate treatment of swine in need of health care	Animal health/disease/lesions (awareness, identification, diagnosis)	Visual check	Production manual (Disease Control and Treatments), Disease Id. Handbook, certified labs
	Treatment options	Record per occurrence	Production manual (Disease Control and Treatment-all chapters), BOC Field Guide for Post Mortem Exam of Swine, Compendium of Veterinary Products
Use of humane methods to euthanize sick or injured swine not responding to care and treatment followed by proper disposal	Identification of terminal status	Visual check	Production manual (Disease Control and Treatment-all chapters)
	Euthanasia options	Visual check, weekly reporting	Production manual (Disease Control and Treatments-all chapter), On Farm Euthanasia of Swine booklet, Weekly Breeding Herd Activity Record

step guide to creating an effective environmental management tool.

The producer EMS makes it easier to comply with state and federal regulations and develop methods for continual improvement. The EMS template is available free from Murphy-Brown, the North Carolina Division of Pollution Prevention and Environmental Assistance, the North Carolina Pork Council and the National Pork Producers Council.

## **Animal Welfare Management System (AWMS)**

Having seen the many benefits obtained through the development and implementation of our ISO 14001-certified EMS, we decided to utilize a similar management system approach to ensure that our animals are well cared for.

Although animal well-being has always been a priority at Murphy-Brown, this topic is emerging as a major industry issue and a growing area of interest to company shareholders, our customer base, government officials and the public.

As such, it is increasingly important to be able to provide objective evidence that our animals are managed in ways that assure their well-being. Utilizing some of the same management principles and methods articulated in the ISO Standard and currently being employed within the company's EMS, Murphy-Brown set to work developing an AWMS.

The goal was to create an animal welfare program that would:

- Ensure well-being of the animals;
- Ensure compliance with legal requirements;
- Promote continual improvement;
- Provide objective evidence of sound animal management.

## **Performance standards vs. design standards in AWMS development**

In the process of understanding the fundamental concepts of an EMS we learned that the ISO 14001 Standard was based on the theory of a performance standard approach as opposed to a design standard approach.

A performance standard can be described as a range of possible outcomes that might be anticipated based on a range of inputs. Outcomes in the AWMS can range from the optimum desired outcomes (no non-conformances) to least desired or unacceptable outcomes (major non-conformances).

Zero non-conformances means we are achieving a level of animal well-being that conforms to all of the commitments articulated in Murphy-Brown's Animal Welfare Policy. A major non-conformance indicates that one or more of the commitments listed in the policy are not being achieved.

Determinations relative to conformance or non-conformance are made through a series of measurements and observations by trained personnel and by a series of both internal and external audits. An example of a performance standard from the AWMS would be answering the question "are pigs in a nursery exhibiting behavior that would indicate they are too hot, too cold or comfortable based on observations by an adequately trained person, without regard to the temperature in the room?"

A design standard can be described as a series of predetermined parameters which, if implemented and adhered to, would presumably deliver a predictable outcome. Design standards can come from engineering estimates of an outcome given a known input. The range of outcomes can run from the predicted optimum to the predicted least desirable or unacceptable.

The concept of design standards contemplates that if the desired range of inputs is provided, the outcomes will likewise be desirable. What determines conformance to a design standard is whether the prescribed set of desirable inputs is being provided. An example of a design standard for the same aforementioned nursery pigs would be "is the temperature in the nursery room within the range prescribed in the design standard, without regard to the actual behavior of the animals?"

Both design standards and performance standards have their place. However, we and our independent consultants made the determination that in the realm of animal well-being it is more appropriate to follow the performance standard approach as opposed to the more prescriptive design standard approach. We felt it was more important to design and maintain an animal welfare system based on its ability to promote well-being by observing and adjusting than to utilize a system focused primarily on a set of prescribed design parameters.

## **Development of our AWMS**

With this basic underpinning in our philosophy decided we began to develop our AWMS.

Drawing from the talents within the Murphy-Brown and Smithfield Foods organizations, an animal welfare committee was formed to develop the program. Experts from a variety of disciplines including veterinary medicine, reproductive physiology, production management, marketing, management system administration, legal, logistics, and public affairs were included on the committee to

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ensure animal well-being issues would be evaluated from many different perspectives.

The committee's work culminated in adoption of an AWMS that is guided by Murphy-Brown's Animal Welfare Policy and commits to providing:

- Comprehensive written animal welfare programs to ensure animal well-being.
- Shelter that is designed, maintained and operated to provide a physical environment that meets the animals' needs.
- Access to adequate water and high-quality feed to meet animal nutrition requirements (production facilities) and in accordance with the Humane Methods of Slaughter Act of 1978 (processing facilities).
- Humane treatment of animals that ensures their well-being and complies with all applicable legal and regulatory requirements.
- Identification and appropriate treatment of animals in need of care.
- Humane treatment of animals which meets or exceeds the requirements of the Humane Methods of Slaughter Act of 1978, and all applicable American Meat Institute Animal Handling Guidelines (processing facilities).
- Timely use of humane methods to euthanize sick or injured animals not responding to care and treatment.

In order to assure that the AWMS would be credible, science-based and auditable the committee retained the services of Dr. Stan Curtis from the University of Illinois and Dr. Temple Grandin of Colorado State University, two internationally recognized experts on animal behavior and animal handling.

Dr. Curtis, a Professor of Animal Sciences at the University of Illinois at Urbana-Champaign, has said of our AWMS:

Smithfield Foods, through its Murphy-Brown subsidiary, was the first major hog producer to take a serious look at formalizing its animal welfare efforts. Its Animal Welfare Management System (AWMS) is now serving as a model for other companies in the industry. In developing its AWMS, Murphy-Brown involved people in every aspect of the production process. As a result, the company was able to ensure that processes discussed in meetings could actually be implemented in the barn and elsewhere. As is always the case in such efforts, the commitment of top management is essential to ensure success. I saw that in the case of Murphy-Brown.

Dr. Grandin is especially pleased that Murphy-Brown's AWMS successfully addresses animal-welfare critical control points she feels are very important, including scor-

ing animal body condition; handling movement of animals; electric prod use; euthanasia; body-lesion scoring; stall size; life-support back-up; and the policy on non-ambulatory animals.

Our AWMS is audited by United States Department of Agriculture (USDA) Process Verified program to verify continued conformance to the AWMS requirements.

By utilizing two of the world's foremost experts in animal well-being and an independent third-party auditor, we have developed a means of assuring that our animals are safe, comfortable and healthy.

## **Conclusion**

No single set of rules or expectations can provide explicit guidance for every situation we face in dealing with today's complex set of regulations and consumer expectations.

A certified, auditable management system, however, is a tool that can bring order to these tasks. It is critically important that producers maintain a reputation as good stewards who take their environmental and animal well-being responsibilities very seriously. Ultimately, it is the responsibility of every farm owner, manager and employee to use credible, science-based policies and practices as they go about their daily tasks.

We must all remember these expectations, and ask questions whenever we are in doubt as to the appropriate course of action. By acting consistently and utilizing effective management systems, producers will have a more orderly means of managing on-farm affairs and demonstrating to our stakeholders that we are good stewards living up to our responsibilities.

## **Biographical information**

Don Butler serves as director of government relations and public affairs for Murphy-Brown LLC. He was instrumental in developing Murphy-Brown's Environmental Management System (EMS) and Animal Welfare Management System (AWMS). Don began his career in the pork industry in 1990 with Carroll's Foods. As environmental manager for Carroll's Foods (acquired by Smithfield Foods in 1999), Don developed an EMS designed to meet ISO 14001 standards. In March 2001 Carroll's was the first livestock production company in the world to receive ISO 14001 certification.

Don has served in a variety of capacities with state and national pork industry and agriculture support associations and organizations, including past president and board member of the North Carolina Pork Council. He currently serves as board chairman for the Animal Agriculture Alliance, a national membership organization representing

all food animal species groups that deals primarily with animal welfare issues at the national and international level.



Don and his father operate a 7000 head wean-to-feeder hog operation on the farm where he grew up in southeastern North Carolina.