Raising Hogs for Market

In partnership with USDA-Risk Management Agency

**Location:** Wood Family Farm, Turner  
**Dates:** Tuesday, July 17, 2012  
**Time:** 2:00 p.m. – 8:00 p.m.  
**Cost:** $30 per person or $45 for partners from the same farm sharing materials

Dan and Jodine Wood of Wood Family Farm will be hosting this workshop and sharing about their farming practices and challenges, including feed and nutrition. Chris Hansen of Mosaic Farms in Philomath will speak about their philosophy and logistics of pasturing pigs. Gene Pirelli, Swine Specialist with OSU Extension Service will present about health considerations. There will be opportunity for discussion about marketing and animal processing options.

Pre-registration is required. Resource materials and a meal are included in the workshop cost. Space is limited to 30 participants. This class is one of five stand-alone workshops in our summer livestock series.

Register on-line at [http://extension.oregonstate.edu/benton/smallfarms/events](http://extension.oregonstate.edu/benton/smallfarms/events) or by visiting OSU Extension Service at the Benton County Sunset Building at 4077 SW Research Way, Corvallis, OR 97333.

For more information contact Melissa Fery at (541) 766-6750 or Melissa.Fery@oregonstate.edu
Raising Hogs for Market
Risk Management for Small-Scale Hog Production

AGENDA

2:00 - 2:15 pm - Welcome
Melissa Fery, OSU Extension Small Farms

2:15 - 2:45 pm - Farm Stories
Dan and Jodine Wood, Wood Family Farm
Chris Hansen and Erin Bartek, Mosiac Farms

2:45 – 3:30 pm – Pig Health
Gene Pirelli, OSU Extension Swine Specialist

3:30 - 4:15 pm – Farm Tour

4:15 – 4:45 pm – Handling and Housing

4:45 – 5:30 pm- Dinner

5:30 – 6:15 pm – Pigs on Pasture

6:15 – 7:00 pm - Nutrition and Feeding

7:00 – 7:45 pm – Marketing and Meat Processing Discussion

7:45 – 8:00 pm – Evaluation and Wrap-Up
FOR 14 YEARS, NEW HAMPTON, IOWA, FARMER TOM FRANTZEN reared hogs from farrow to finish, alternating the 1,200 hogs he raised annually from closed buildings each winter to pastures each summer. The buildings, where Frantzen raised the sows in pens with slatted floors, were an unpleasant winter home. In the cold months, the hogs did not gain weight very efficiently and behaved aggressively.

Pig waste fell through the slats into a pit. Frantzen pumped and disposed of manure on his crop fields, where he grew corn, soybeans and hay. “Our manure management was haphazard,” he recalls. “I was both over-applying and under-utilizing those nutrients.”

Frantzen had to race to the finish line every season. And while he always got everything done, reaching that point was difficult and stressful. In 1992, he decided to create a more environmentally sound system that would be both profitable and allow him to spend more time outside. The linchpin: a combination of pasture and housing that brought his livestock and crops into sync.

Today, permanent pastures, rotating strip pastures and cropland in managed grazing strips that allow him to produce a 30-pound feeder pig “for half the price you can indoors.”

Photo by Prescott Bergh, courtesy of Minnesota Department of Agriculture
Deep-straw systems provide natural warmth for hogs and require far less financial investment and risk than typical confinement approaches. – Photo courtesy of USDA-ARS

Over three years, Frantzen’s costs to raise a pastured feeder pig ranged from $10 to $13.50, taking into account all supplemental feed, land expenses and labor.

“On a farm that produces grain and finishes hogs, we want the grain to go into the animal during the finishing stage and the manure to go back to the crop fields,” said Frantzen, who also raises 75 Angus brood cows. “From the hoofs, I can put composted manure on the correct field at the correct time. The odors aren’t bad, there’s no pumping involved and it puts the animals in an environment they like.”

Today, Frantzen is as busy as ever, but he is a lot happier. “Working conditions for me weren’t nearly as good as working outdoors,” he said. “The health of the animals wasn’t good, either. You could almost see the stress on the sows in the farrowing crates. Now, they seem to enjoy life. And so do I.”

Farmers like Frantzen who successfully produce pork on a small scale have preserved their independence in the face of the consolidating hog industry. In the late 1980s, hogs began disappearing from small family farms. Now, most pigs are produced by corporations, with 35 percent of hogs sent to market produced by just 20 firms selling more than 500,000 per year. Usually, one company owns the pigs and retains farmers to raise the animals – often on the farmer’s property, using his buildings and manure lagoons.

Those changes have narrowed choices for farmers, steering most toward a new option – working under a contract using the corporation’s methods of production. Corporate contracts offer pork producers more certainty about earning modest profits than raising pigs independently but also require farmers to shoulder considerable debt to construct confinement buildings and assume environmental liability for manure.

The corporations own the processing plants and distribution system, too, effectively locking small, independent producers out of the wholesale pork market.

“It is hard for small producers to put together a semi-load of market hogs or find a buyer who will even accept hogs without a contract,” said Martin Kleinschmidt, an analyst with the Center for Rural Affairs. “If you want to sell commodity hogs, you have to be big. If you want to stay small, you have to look for niche markets.”

This bulletin showcases examples of another way to raise pork profitably. While many of the farmers profiled here have assumed bigger workloads – particularly in designing hog systems that work on their farms and identifying unique marketing channels – all appreciate the greater flexibility and a better quality of life inherent in systems with alternative housing or a strong pasture component.

Use this bulletin to gain ideas about alternative swine systems, then consult the list of resources on p. 16 for more detailed information.

YEARS AGO, PIGS FORAGED IN PASTURES, WALLOWED IN MUD to stay cool and nested in family units. Now, most pig producers raise their animals in confinement buildings containing thousands of pigs with sows in two-feet-wide crates. Lately, some farmers and consumers have begun to balk at that system.

“When the current conventional systems create profound, widespread concerns, we are compelled to look elsewhere for solutions,” said Mark Honeyman, an Iowa State University researcher and national expert on alternative swine housing options. “The public’s growing concern about the environment and the impact of vertical integration upon rural communities, worker health and animal welfare calls for innovative approaches and ethical judgment in the ways producers raise pigs.”

DETERMINING THE RIGHT ALTERNATIVE HOG SYSTEM

Before overhauling a hog production system, evaluate your resources, define your goals and visualize what type of operation might work best. In weighing your options, consider your buildings and what might be renovated to fit your goals, as well as your pasture or forage options.
Consider also your location and whether you have access to processing and markets. For more information about planning for a new farm enterprise, consult “Hogs Your Way.” (See “Resources,” p. 16)

The significantly lower start-up costs for alternative swine systems may be one of the most convincing factors for producers, especially beginning farmers who may have difficulty raising capital. Other farmers adopt the systems because they allow great flexibility. Inexpensive, easy-to-build hoop structures, for example, incur no debt and are easy to adapt for other uses.

“These systems appeal to someone who doesn’t want to borrow capital,” said Honeyman. “If you construct a building that costs hundreds of thousands of dollars, you’re going to produce, whatever happens. If you want more flexibility, you need a lower cost option. In a rapidly changing industry, why not create a system that’s flexible rather than one that locks you into a certain production system?”

DEEP-STRAW SYSTEMS
When Swedish regulators imposed stricter animal welfare laws, banned sub-therapeutic antibiotics for livestock and passed other environmental protection laws in the late 1980s, hog farmers pulled pigs out of confinement crates and into group settings. By providing deep straw bedding for groups of pigs, Swedish farmers turned manure into a solid waste, provided warmth and exercise and created an opportunity for the animals to develop natural herd and social instincts that they say promotes better animal health and less piglet mortality.

Many alternative hog systems rely on deep straw. Mixed with the hogs’ urine and manure, the deep straw bedding composts in hoop structures. In addition to providing heat, deep straw systems center on hogs growing in groups and allow the pigs freedom of movement.

While much less capital-intensive than confinement swine systems, alternative systems relying on deep straw require careful farm management to minimize disease and provide the feed and bedding hogs need at different stages of life. In economist parlance, raising pigs in these systems means more variable costs – feed, bedding, labor – versus fixed costs such as confinement buildings. Alternative swine researchers like to point out that such systems provide flexibility and less up-front investment.

While the systems are gaining in popularity, especially in England and Sweden, their use in the United States is still clustered in the Midwest, particularly Iowa and Minnesota. Raising hogs in deep straw can be accomplished virtually anywhere because it keeps hogs warm in cold climates. (It’s easier to keep hogs warm than cool because hogs only sweat through their noses and have difficulty losing body heat.)

“Alternative swine production systems allow more freedom of movement and choice to the pig and require a unique style of husbandry,” said Honeyman. In 1995, Honeyman won a SARE grant to explore the feasibility of importing Swedish systems here and hosted a group of visiting Swedish researchers, farm advisers and farmers for 10 days.

FARROWING IN DEEP STRAW
Some farmers use deep straw for farrowing piglets. Researchers have found that providing individual pens with straw for farrowing sows – but larger rooms with straw for group gestation and lactation – reduces stress by giving the pigs and sows something to root through. Sows on deep-bedded systems are always group-housed, which helps encourage them to go into heat simultaneously.

Hog farmer Dwight Ault’s decision to move from a confinement system to deep straw for farrowing was a financial necessity. The Austin, Minn., farmer had 26-year-old crates, gates and other confinement materials badly in need of an upgrade. Aided by a SARE producer grant, Ault decided to emulate a system he had seen firsthand in Sweden and converted a barn for deep-straw farrowing. The work cost $3,000, less than one-third the cost of replacing the confinement equipment.

“I was sick and tired of the ammonia and smell” in the old confinement system, he said. “I figured that my enjoyment of raising hogs would be enhanced.”

Why Switch?
- Minimize environmental concerns such as water and air quality
- Improve hog worker health, which can be compromised by dust and gases in confinement buildings
- Assume less financial risk
- Create fewer objectionable odors
- Assume lower start-up costs
- Minimize neighbor problems when farming near population centers
- Manage animals rather than equipment and automated machinery
- Provide pigs with access to bedding, freedom of movement, sunshine and each other
Today, Ault farrows 60 sows in the deep-bedded system each January, then on pasture each June. After his second season using deep-straw farrowing, in 1998, Ault declared he “never had better performance” from the pigs. “If anything, I’m worried that [production is] going to be way ahead of schedule,” he said.

Deep-bedded farrowing requires a room large enough to house about 10 farrowing sows. Providing temporary farrowing boxes in the nursing rooms enables the sows to build straw nests in which they give birth. Piglets stay in the boxes for up to 10 days before farmers remove the boxes and encourage them to mingle with the group.

In the winter, the heat generated by the sows and the composting straw means farmers do not need to provide as much supplemental heat. Large windows and doors allow air to flow, and ventilation systems draw fresh air. The quiet ventilation system allows the sows and piglets to better communicate, which may reduce pig deaths by crushing.

In general, the Swedish farrowing system requires more management, observation and planning than a conventional system, but labor averages only about 18 hours per sow per year. Sow culling rates, building repairs, cleaning, moving, medicating and assistance at farrowing are lower in the Swedish system. However, piglet mortality can be higher in the Swedish system compared to conventional farrowing crates.

When farrowing in deep straw:
- Use enough straw (usually two large round bales) to insulate the pigs from cold cement or ground to start a nursing room of eight to 10 sows.
- Add a bale per week, plus more as needed.
- Allow 27 square feet per sow and 81 square feet per sow and litter.
- Be vigilant about cleanliness to prevent disease.

**Raising Feeder Pigs in Hoop Structures**

Tent-like shelters that house hogs for a fraction of the cost of a typical confinement house, hoop structures are gaining in popularity as producers realize the benefits of this simple structure that resembles a giant, opaque greenhouse. Originally developed in Canada, “hoops” usually hold up to 250 hogs on an earthen floor that is heaped with a generous amount of bedding. The structures are topped with 15-feet-high steel arches covered with fabric tarps.

Iowa State University researchers found that initial investment was about one-third cheaper for hoop barns than confinement barns. Confinement operations cost a producer $180 per pig space versus just $55 for a space in a hoop structure. Initial hoop barn construction costs vary from $9,000 to $16,200 to hold 200 head – compared to $150,000 to $200,000 for confinement structures that hold 1,000 head.

“Hoops are attractive to a lot of people who don’t have a lot of equity to invest,” said Mike Brumm, an extension

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**SWEDISH-STYLE HOG PRODUCTION IN MINNESOTA**

Minnesota farmer Nolan Jungclaus’ great-grandfather homesteaded the family farm in 1896. But a century later, the crop farm was no longer generating enough revenue to support the three families involved with the operation.

Looking for an income-generating practice that would allow him to quit his off-farm job and help support three families, Nolan Jungclaus decided to test a Swedish-style system on his Minnesota farm. With Iowa State University researchers and farmers, he traveled to Sweden to look at the systems firsthand. Jungclaus found that Swedish farmers fit the system to the animal rather than the animal to the system. In so doing, hog producers must have excellent animal husbandry skills, an appreciation of pig behavior, attention to detail and a desire to work with pigs in a more natural environment.

In 1994, Jungclaus received a SARE producer grant to adapt an existing 36-by-60 foot machinery pole shed to accommodate four phases of Swedish-style swine production: breeding/gestation, farrowing, nursery and finishing. Lack of experience with livestock led the Jungclauses to decide on a low-cost structure that would be adaptable enough to allow the family to use their investment in other ways, if necessary.

“We wanted to maintain flexibility in our operations so that if we were poor managers or if there were drastic changes within the hog industry, we could still salvage our investment,” Jungclaus recalls. “Our goal was to diversify the current
swine specialist at the University of Nebraska. “They can pay the day-to-day costs, but don’t have to come up with the big money up front.” Hoop structures are “favorable to beginning farmers who don’t have the equity.”

Most hoop structures are used for finishing feeder pigs. Since 1996, close to 3,000 hoop structures have been built in Iowa, where much of the research into alternative swine housing systems is taking place. At Iowa State University, a team of researchers comparing finishing pigs in hoops versus confinement systems found that “hoop pigs” grew slower in winter and were less efficient than the confinement pigs. In summer, however, the opposite was true.

Yet, weight gain must be compared to costs of production. Overall pig production costs in hoops have been reduced by approximately $4 per hog, according to the nonprofit information clearinghouse, Appropriate Technology Transfer for Rural Areas (ATTRA).

Deep bedding really works as a source of heat. In the winter, researchers have recorded bedding temperatures in hoops to be at least 80º F.

Another big difference between hoop barns and standard hog confinement houses is air flow. While hoop barns are naturally ventilated, confinement systems have forced air systems that rely on electrical power. If a farmer experiences a blackout, the fans cut out and the pigs may die from toxic gas buildup. Most confinement systems therefore include backup generators, which are an added expense and worry for producers. By contrast, Canadian researchers have found that 94 percent of hogs raised in hoop barns exhibited normal lung function, compared with 70 percent of the hogs reared in confinement.

Pigs raised in hoops may develop internal parasites, so aggressive worming is recommended. Otherwise, pigs in hoops are reportedly quite healthy, with foot and leg problems greatly reduced. (See “Animal Health” in Part II.) Hoop structures require labor to unload bedding, haul solid manure and check pigs.

When evaluating hoop houses:

Remember that a supply of good-quality bedding is a major consideration.

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farm operation by establishing a farrow-to-finish swine facility with attached pasture.”

They purchased 15 bred sows the first year. Having all of the sows farrow within five days is ideal for the system, although the Jungclaus’ sows farrowed over a 10-day period. They started their sows in temporary nesting boxes measuring about 8 feet by 8 feet that they removed after a week to allow sows and piglets to roam inside the building.

They provided ventilation from intake and exhaust fans, plenty of space (the equivalent of about 80 square feet per sow and litter), and quiet surroundings — where the pigs can exhibit natural desires to nest and live in family units.

In the first year, the operation showed a small net loss, but that took into account the $10,682 in initial capital purchases and livestock supplies the first year.

“Overall we had a net worth increase of $7,213,” said Jungclaus. “Although there will be some capital improvements made to the system, I anticipate a profitable system based on a capital investment loan payment of only $2,400.”

Six years later, Jungclaus has found that he can turn a profit using the Swedish-style system. In fact, he improved farm efficiency from 65 percent to 70 percent, meaning he now spends 65 cents per dollar earned, thanks to the more diverse farm operation.

While Jungclaus now raises about 400 head a year and markets the hogs through a buying station, his involvement with the new Prairie Farmers Cooperative means he will soon be able to sell his pork as a “natural” meat free of antibiotics. Jungclaus serves on the co-op board, which is overseeing construction of a new hog processing facility scheduled to come on line before the end of 2001. Already, two grocery store chains in the area have expressed interest in the co-op’s product.

The Swedish-style system produces a happy, healthy pig free of antibiotics and offers the Jungclauses a clean, healthy working environment. Jungclaus now farms alongside his children, who are often found playing with piglets.

“We felt diversifying our farm was the first step, but there were other family and community oriented goals we considered,” he said. “We wanted a livestock enterprise that would allow us to work together as a family unit and that would increase our family time and give us the opportunity to teach our children responsibility. We also wanted a community-friendly facility because we are one mile down the road from town.”

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Pig production costs have been reduced by about $4 per hog in hoop barns, built at a fraction of the bill to erect a confinement structure.

– Photo by Jerry DeWitt
Expect higher feeding costs. During the colder months, pigs in hoop structures may need about 10 percent more feed than their confinement counterparts to recover the energy spent keeping warm.

Make sure you have the equipment necessary for manure loading and handling.

Develop an internal parasite control program.

Take advantage of the versatility of hoop structures, which may be used for other livestock or storage needs.

**Raising Pigs on Pasture**

**Farrowing on pasture.** In recent years, hog farmers thought sows needed to farrow in confinement to ensure piglet survival. However, some criticize the system as promoting ulcers, sores and behaviors such as bar biting. Instead, producers are raising sows outdoors to allow them more space and access to fresh air and sunshine. Researchers and farmers have found that, with small portable huts and good pasture, they can drastically reduce the cost of production.

Outdoor pig production on a large scale is gaining a foothold in the southern High Plains because of the moderate climate, relatively flat land and sparse population. In fact, the traditional cattle country of the Texas panhandle is beginning to diversify into hogs. Texas Tech University’s Sustainable Pork Program began studying intensive outdoor pig production in 1993 and, in 1998, built a research farm dedicated to exploring profitable, environmentally sound systems they call “animal-, environment-, worker-, and community-friendly.”

The prototype, larger than the indoor-based models, operates within a paddock system that requires about 100 acres for every 300 sows— or three sows per acre. The 12-acre paddocks radiate out from a central circular area, used for handling and observation, and are demarcated by electric fence. The separate paddocks isolate breeding, gestation, farrowing and pasture growth.

Texas Tech researchers are evaluating production costs, behavior and environmental impacts, dust and microbe levels, and pork quality. Thus far, they have found improved pig health, a better work environment, less odor, less microbial activity, fewer regulatory problems and lower start-up and operating costs. More specifically, they found it costs $23.20 to raise a pig in “intensive outdoor” production versus $31 in a typical confinement system. In that 1995 study, they found a net profit of $10.39 per pig in the outdoor system.

The institute’s director, John McGlone, is sure sustainable pastured pork systems will take off once more producers learn of their environmental benefits, lower start-up costs and marketing opportunities. “Pigs are going to be bigger than cattle on the southern Plains, and it could happen within the next 10 to 20 years,” said McGlone, who has received lots of ink in newspapers and magazines in Texas and beyond for his new production model.

A study conducted in Iowa by Mark Honeyman and Arlie Penner of Iowa State University compared economic and production data of indoor and outdoor herds. Results showed that fixed costs for the outdoor herds were approximately $3 less per pig weaned than for the indoor herds. “There is much variation between individual producers’ costs within a given system,” Honeyman said. “A lot of producers are doing it for other reasons,” primarily the low start-up costs and improved quality of life. In the Midwest, pasture farrowing is limited to spring, summer and fall.

Large pasture farrowers have developed time-saving systems, such as arranging huts in set patterns or creating same-size paddocks so fencing and water lines can be pre-measured.

The main cost in a pasture hog system is supplemental feed, with grain accounting for 60 to 70 percent of the cost from farrow to finish. Lately, more hog producers are allowing their pigs to graze directly on grain crops to cut down on the labor and expense of harvesting row crops. ISU researchers studying the feasibility of grazing sows on alfalfa found similar costs for raising sows in confinement versus grazing alfalfa in a managed four-paddock rotational system. The grazing animals were

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*In a well-managed farrow-to-finish pasture system, producers can net more than $10 per pig, according to Texas Tech University.*  
— Photo by Jerry DeWitt
supplemented with 1.5 to 2 pounds of corn per day. In the meantime, the alfalfa stand improved the soil.

Although an Iowa study found that outdoor farrowing produced fewer piglets per litter, the lower costs of production makes it more profitable than confinement. Honeyman said that fixed costs were $3.33 less per pig weaned outdoors, 30 to 40 percent lower overall than confinement systems. Production costs for a 250-pound outdoor market hog were $4.88 less per pig, reflecting feed, labor, repairs, utilities, health and fixed costs.

The environmental considerations, too, make this an attractive system for hog producers. While grazing through different paddocks, the hogs evenly distribute manure across the field. Pastures can be seeded or natural, and including leguminous plants like alfalfa in a rotation can improve nitrogen cycling and supply a nutritious feed for pigs. One of the biggest benefits of raising pigs outside is giving the animals access to mud, water and shade to cool themselves. McGlone recommends that producers design and build wallows for them.

Hog producers use a variety of wood, metal, or plastic huts to house their farrowing sows. Lined with bedding – hay, corn cobs, cornstalks, straw or shredded newspaper – the huts stay warm despite outdoor conditions. At Texas Tech, researchers use English arc-style huts to decrease the likelihood of piglet crushing.

If farrowing hogs on pasture, keep in mind:

- When choosing a farrowing hut, seek portability and an easy entrance and exit for the sow and litter.
- Pasture systems require portable waterers and feeders.
- Do not use floors in farrowing huts and move huts to fresh ground for each new litter.
- Labor is more seasonal than in confinement systems, so evaluate whether to raise one or two litters per sow each year and time group farrowing around crop chores.
- Most swine herds suffer from internal parasites that may persist in soil. Develop a rigorous parasite control program as part of a whole-herd health program.
- Fencing options vary, although some veterans recommend steel wire or electric fences that use rolls of netting on fiberglass posts for greater visibility.
- Thanks to the low start-up costs, pasture systems create an ideal way for new hog producers to get started in the industry.

**Feeding hogs with pasture.** New Hampton, Iowa, farmer Tom Frantzen grazes his gestating sows in permanent paddocks in the warm season. He plants corn alongside strips of pasture, partly to provide shade or act as a windbreak. Sows about to farrow graze on corn, oats and clover strips. Then, as cold approaches and the sows are ready to give birth, Frantzen moves them into a straw-bedded cattle shed. The sows overwinter in the shed, while the piglets spend the rest of their lives there. Each spring, Frantzen re-seeds his 30 half-acre paddocks and the system begins anew.

Jim and Adele Hayes raise poultry, cattle, pigs and sheep on 200 acres of pasture in Warnerville, N.Y. They believe their intensive pasture management has strengthened the operation, both by adding biological diversity and creating marketing options. During the grazing season, they rotate ruminants through a series of paddocks to provide high quality forage and to allow the pasture to re-grow before animals return to graze.

Careful attention to pasture conditions makes the system work. “We have a ‘sacrifice’ pasture near the barn that’s well fenced so it’s easy to maintain the animals in there,” Adele Hayes says. “We allow that to get destroyed if we need to,” a better option, she says, than damaging prime pasture acreage through overgrazing.

The pasture-based system developed at Texas Tech’s Pork Industry Institute moves 600 sows through paddocks developed for different reproductive stages.
**Manure Management**

The best type of waste management in any livestock operation converts manure into a resource rather than creates a disposal problem. Many hog producers also raise crops, so manure, treated correctly, offers a valuable soil amendment. Manure from a 50-sow operation is worth about $4,000 as a fertilizer, although other benefits such as increasing organic matter, enhancing soil structure and building more diverse soil organisms make it even more valuable.

In pastured hog operations, the hogs distribute manure themselves as they move across a field. With proper rotations and a reasonable stocking rate, manure does not pose a problem. Manure from hogs raised in deep bedding mixes with the straw or other material and becomes a solid pack that is relatively easy to handle. The manure-bedding mix adds another plus. Bedding materials contain high amounts of complex substances, such as lignin, that do not decompose rapidly and therefore improve the soil’s organic matter and tilth over the long term.

Roger Hubmer of Mankato, Minn., analyzes his manure mixed with cornstalk bedding so he can knowledgeably apply it to his crop fields. Hubmer, who began finishing hogs in hoop barns when he realized he didn’t want to spend $100,000 on a new confinement barn, spreads compost based on the phosphorus rating.

**Odor and Pollution**

One of the biggest considerations about raising hogs is odor generated from manure. Stories about bad-smelling manure lagoons and community opposition to large hog confinement operations regularly appear in the media. Liquid manure stored in a lagoon sits in an anaerobic state, and that creates disagreeable odors. The smell might be unpleasant for people nearby, but some of the gases produced – methane, hydrogen sulfide, carbon monoxide and ammonia – can be toxic.

If there’s a power outage in a confinement building, pigs face very real dangers, including death, from heat and the gases that build up in liquid anaerobic manure systems. Many confinement hog operators equip their buildings with alarm systems and backup generators. Such high-tech systems come at considerable cost. The free flow of air through a hoop structure, however, eliminates the need for such expensive systems.

“Hog odor is the most divisive issue ever in agriculture, damaging the fabric of rural society and disenfranchising pork producers from their communities, even on the roads in front of their farm,” said R. Douglas Hurt, director of Iowa State’s Center for Agriculture History and Rural Studies.

Outdoor systems eliminate the problem. There is virtually no odor at Texas Tech’s pastured pig demonstration site, said John McGlone, who runs the facility. “I told some colleagues from NRCS that it wouldn’t smell and they didn’t believe me,” he said. “I had them out there in the fields a year after we started and they couldn’t believe it. It doesn’t smell.”

Perhaps worse than odor concerns is the potential of swine lagoons to leak into surface water or groundwater. In September 1999, Hurricane Floyd wreaked havoc throughout North Carolina. Particularly hard hit
was the state’s huge hog industry. Overall farm losses were estimated at more than $1 billion, with at least 21,000 hogs drowned or washed away in their pens. Water pollution became a serious threat partly due to floodwaters carrying away manure from countless hog lagoons.

“Confinement poses more risks,” Honeyman said. “If we concentrate these animals, we also concentrate animal waste, so our risks of environmental degradation increase.”

A solid manure system, on the other hand, doesn’t leak or spill. The only threat to water quality is possible leaching from the composting bedding pack if it is stored outside in heavy rain. As an aerobic process, composting, done correctly, shouldn’t emit objectionable odors.

“It may sound funny,” said Hubmer, the Mankato, Minn., farmer, “but the composted manure that comes out of the hoops is almost sweet-smelling.”

Pastured systems pose even less of a risk. At Texas Tech, researchers installed a buffer of Old World bluestem around the site to catch runoff from heavy storms. It works, too, McGlone said. “You can see the runoff isn’t leaving,” he said. “Our pastures are dark green, while the buffer is pale green,” indicating that nitrogen is staying on the pastures.

“If it’s done right, manure and nutrient runoff is not an issue.”

**HAWAIIAN DRY LITTER SYSTEMS** – By Barb Baylor Anderson

Producers in Hawaii are exploring a different approach to manure and nutrient management that employs a dry litter technology. The system, imported from land-limited countries like the Netherlands, Japan and Taiwan, could help producers effectively manage livestock waste, especially since Hawaii producers contend with more expensive land and bedding costs. Moreover, Hawaiians face truly unique ecological issues.

“Animal manure can be processed and developed as a marketable organic soil amendment for the agricultural, garden and landscape industries,” reports researcher Glen Fukumoto with the University of Hawaii Cooperative Extension Service. “The interest in organic products is creating opportunities for innovators of nutrient management.”

Dry litter systems must be adapted to work in the tropics because excessive heat, disease and parasite build-up in litter are common. With funding from SARE, university researchers have worked to adapt the dry litter system to the state. The work began with a demonstration on an intensive 10-acre pig farm/orchard and market garden at 1,600 feet altitude. There, the lava is thinly covered with erodible soil that has low nitrogen and organic matter content — and could benefit from nutrient-rich compost.

The modified dry litter system that has evolved from the research combines animal manure with shredded green residue from orchards, market gardens and landscape operations to produce compost. Dry litter systems also reduce or prevent non-point source pollution by eliminating the use of water to clean hog production facilities.

“Elimination of water in the system removes the possibility of pollution from various components of a typical confined feeding operation waste management system,” said Fukumoto.

The key to the system is sloping pen floors that through a pig’s hoof action propel the litter material out of the pen and into a holding trench. The carbon-nutrient mix flows out of the pens, and the separate composting trench keeps hogs from exposure to pre-compost material, where diseases and parasites may develop. This separation is the key difference in the modified design.

Masazo’s Pig Farm on the southern point of the Big Island of Hawaii has used the modified dry litter system since 1996 to collect and compost manure from 30 to 40 sows. Masazo’s owners, Dane and Terri Shibuya, constructed a modified greenhouse structure with two sets of pens for sows in different reproductive stages. Their system, which contains no mechanical parts or specialized equipment, provides cover and protection for the animals while collecting manure in a pit. After mixing the manure with carbonaceous material, they spread the compost on bananas, ti leaves and taro in their fields.

Cost analysis shows initial construction at approximately one-fourth the cost of a typical system in Hawaii. In addition, dry litter systems have lower operational, maintenance, labor and water costs, and may avoid potential water pollution fines and legal costs emanating from odor complaints.

One of the greatest benefits is the potential for economic return from the compost. When the litter compost was applied to market garden bananas in the initial demonstration, for example, researchers measured savings of $201 per acre.

“The modified dry litter system concepts may be adapted to larger, temperate ecosystems utilizing the hoop-type structures,” said Fukumoto. “The dynamic flow of animal and green waste streams eliminates composting heat in pens and reduces exposure to disease and parasites. Ultimately, the value-added nutrients generate either a new revenue stream or fertilizer savings for the integrated farm.”
Soil improvement is a built-in benefit of alternative swine systems. Some producers plan their grazing strategies not only to manage the pasture, but also to build the soil for other commodities, such as feed grain or cash crops. Planning a rotation with crops that both improve soil and complement a hog operation makes doubly good sense. Oats, for example, can provide straw for bedding and nutritious feed for sows. Moreover, raising pigs on pasture growing on ground that previously raised a crop can break pest and disease cycles in the rotation.

Frantzen of New Hampton, Iowa, also raises brood cows, alternating the livestock through the same paddocks. Rotating both cows and hogs through the pastures has helped the soil, he said. “Either one of the livestock groups on their own would make it hard to manage the ground cover,” he said. “But I’ve noticed that when they rotate through the same pasture, hogs and cattle will eat a wider range of plants and improve soil stability.”

Animal Health

Increasingly, confinement systems have been found to have adverse effects on hog health and well-being. Studies from the United States and abroad report that animals raised in confinement experience increased aggression, higher incidence of abnormal behavior, decreased response to external stimuli, and numerous physical and chemical indicators of stress, such as shoulder lesions from rubbing on crates and flooring and diarrhea in piglets.

Toxic gases such as methane, ammonia and hydrogen sulfide can threaten hog health, particularly in older confinement facilities, or when ventilation systems fail. Even at lower concentrations, these gases can lead to decreased respiratory function.

Dust in swine facilities may contain particles of feed, feces, dried urine, swine dander, pollen, insect parts, mineral ash, mold and bacteria, according to 1999 articles in the Journal of Agromedicine and the Journal of Agricultural Engineering Research. Those biological, chemical and physical components of dust are blamed for elevated mortality and incidence of pneumonia, rhinitis and pleuritis, among other conditions reported in pig houses.

In confinement facilities, producers need efficient ventilation systems with high airflow volume to rid the structures of dust and gases. By contrast, hoop structures or pasture systems do not require automated ventilation systems. Outdoor systems may have greater incidence of internal parasites, however, as discussed below.

Producers can anticipate that hogs raised in deep bedding or on pasture likely will have fewer respiratory diseases and foot and leg problems. Most producers using conventional systems routinely add antibiotics to feed or water to help prevent disease or stimulate growth.

Dave Serfling of Preston, Minn., who successfully converted an old farm building into a deep straw wean-to-finish facility, observed greater health benefits for his pigs. He had pasture-farrowed hogs for 25 years, but with help from a SARE grant, added a winter deep straw system. What he saw impressed him – almost all of his pigs reached 240 pounds by six months of age without the use of antibiotics. Moreover, pig mortality was less than 1 percent.

“It worked so well to have mothers with their pigs that we call our remodeled hog house a pre-wean to finish facility,” he said, attributing the better health to the combination of straw, fresh air and sunshine.

To prevent disease, experts recommend moving entire groups of hogs. “Strict all in/all out grouping is very beneficial to the health status and growth performance of pigs,” Honeyman said. “This works best with a proper facility layout where pigs are born in a narrow time window and sows avoid cross suckling of older and newborn pigs.”

Producers will need to take a proactive approach with internal parasite control. The eggs of many worms persist in soil for years. Water and feed dewormers are effective forms of control, and Honeyman recommends following a year-round, whole-herd life cycle health program that includes post-mortem exams, fecal samples, slaughter checks and blood tests to help diagnose pathogens and parasites.
WHILE MEAT PRODUCERS ONCE SOLD PRODUCTS DIRECTLY to customers, the modern feedlot-to-wholesale system sends most meat to the grocery store case. Recently, however, a surge of interest has renewed direct farmer-to-customer meat sales. While selling meat directly offers farmers and ranchers a chance to retain a greater profit share, finding a reliable, small-scale processor who meets federal and state food safety regulations may be difficult.

Meat producers will likely find few slaughterhouses that accept small quantities. A number of innovative pork producers are managing to bridge the gap by forging contracts with small slaughterhouses, pooling hogs or taking advantage of new mobile “processors on wheels” funded by programs like SARE.

NICHE MARKETING

Hog producers can develop niche markets for their pork by emphasizing the animal welfare benefits or environmentally friendly aspects of their systems.

A survey of Colorado, Utah and New Mexico grocery shoppers determined that many – especially high-income frequent pork consumers and those concerned about growth hormones and antibiotic use – are willing to pay a premium. “These target consumers are very concerned about the production practices utilized by the producers,” writes Jennifer Grannis and Dawn Thilmany of Colorado State University, who surveyed 2,200 shoppers and analyzed 1,400 responses in 1999. “A highly visible and descriptive label that highlights production practices must be part of the packaging.”

Research funded by the Leopold Center at Ames, Iowa, found that consumers would pay nearly $1 more for a package of pork chops labeled as produced under an environmentally friendly alternative system. (The study defined the “most environmentally raised pork product” as being produced in a way that results in 80 to 90 percent odor abatement and 40 to 50 percent reduction in surface water pollution.) The study by ISU economics professor James Kliebenstein surveyed randomly selected consumers in four diverse market areas. Of those, 62 percent said they would pay a premium for pork raised with such a guarantee.

“As the industry develops methods that help sustain or improve the environment, a segment of society will support a market for such products,” Kliebenstein said.

To gauge potential for pasture-raised pork in Arkansas, the Arkansas Land and Farm Development Corporation (ALFDC) worked with the University of Arkansas, partly funded by SARE, to conduct market research into consumer perceptions and preferences.

Almost 70 percent of respondents to a 1998 questionnaire sent to 1,200 consumers and 42 supermarkets and restaurants in the Delta region indicated a preference for “environmentally friendly” pork products over conventional. More than 73 percent identified pasture-raised pork as natural and healthy, and 65 percent of retailers preferred to sell local, organically grown meat if available at premium prices.

After perfecting his rotational grazing system, LaGrange, Ind., hog producer Greg Gunthorp turned to marketing. “I spend more time marketing than I do farming,” he said.

Meeting and getting to know the chefs at the best restaurants in Chicago is a major focus, and Gunthorp travels more than 100 miles to the city at least once a week to talk with them in their kitchens. Once the chefs have tasted his product, Gunthorp has little trouble getting orders. He also sells pork at a popular Chicago farmers market, where he simultaneously promotes his burgeoning catering business, which has ranged from wedding receptions to company picnics to family barbecues.

It costs Gunthorp an average of 30 cents per pound to raise a hog to maturity. The lowest price he now gets for his pork is $2 per pound, although he commands as much as $7 per pound for suckling pigs – which weigh in at 25 pounds or less. Overall, Gunthorp’s prices average 10 times what hogs fetch on the commodities market.

The bottom line for Gunthorp is making enough money to keep his family healthy and happy. “We can get by just selling 1,000 pigs a year, and the smarter I can raise them and sell them, the better off we’ll be,” he said.

Direct marketing drives the Hayes’ operation in Warnerville, N.Y. Sap Bush Hollow Farm markets a variety of meat directly to about 400 consumers in New York, Massachusetts, Connecticut and Vermont. They sell a lot of poultry and beef and about 40 pigs each year.

They sell in bulk and as retail cuts – to restaurants, stores and directly from their home – to eliminate distribution costs. Adele Hayes uses newsletters, postcards and even phone calls to inform customers of sale days and products available.
“The demand is incredible for field-raised, naturally raised pork,” she said. “The taste, according to us and our customers, is far superior, as well as the texture.”

In the New England climate, the Hayeses send the pigs outside to graze throughout the summer, then keep them in a barn equipped with deep bedding during the cold months.

Even when it’s cold, the pigs get access to the outdoors and help advance the Hayes’ composting process by rooting through vegetative material.

The couple uses two federally inspected slaughterhouses, although, for the Hayeses, like many other small meat producers in the Northeast, the decreasing number of slaughterhouses remains challenging. “Our biggest problem continues to be reliable slaughter and processing in a timely fashion for our customers,” Hayes said.

COOPERATIVE MARKETING

Given the consolidation climate in the hog industry and the low profit margins for pork, cooperating with other producers to market meat offers a profitable alternative for small and medium-sized farmers.

Patchwork Family Farms, a marketing cooperative supported by the Missouri Rural Crisis Center, rewards 15 pork producers for their dedication to ‘sustainable’ and ‘humane’ growing standards with a fair price, regardless of the market. The market for this Missouri pork is hot. The co-op has seen a doubling in sales volume each year since it was founded in 1994. In 2000, Patchwork earned $250,000 in gross sales.

Patchwork’s expansion has been steady. Originally, the co-op sold to three restaurants. Today, it sells pork to about 40 restaurants, grocery stores, at community events and directly from the co-op’s Columbia office. “It has taken a lot of knocking on doors,” said Lindsay Howerton, Patchwork marketing coordinator. “We have tremendous success with the media. I’ll send out a press release and suddenly I’ll have three TV stations in our yard.”

Howerton attributes the intense interest to the co-op’s unique pricing structure – 43 cents per pound or 15 percent over market price – and dedication to raising pork not in confinement, without hormones and without continuous feeding of antibiotics. “We’ve stepped out of the system,” Howerton said, “and are being extremely successful at it.”

In 2000, Patchwork producers received $50,000 more than if they had sold their hogs on the open market. Producers saw these payments up front, not after the product was sold. Ovid and Mary Jo Lyon, Patchwork producers for several years, have seen the economic benefits.

“Patchwork supports independent family farmers; we just couldn’t continue to raise hogs without this project,” said Mary Jo Lyon. “Patchwork gives my family a way to produce hogs in the same way we always have, out in the open with plenty of sunshine, and we get a fair price for our hogs.”

Other hog producers in Missouri may have an opportunity to tap niche markets, thanks to A Family Farm Pork Cooperative, which has researched consumer support for the concept. What began as a small project blossomed to serve producers in 20 counties with a pork slaughtering plant and a cooperative marketing plan, initially in the St. Louis area.

Feasibility studies for value-added pork, “have shown this will be a good venture,” said Russell Kremer, president of the Missouri Farmers Union and co-op director, who received a SARE grant to explore alternative ways to distribute Missouri-grown food. Producers interested in the slaughtering plant have offered some 250,000 hogs per year.

“A common strategy to gain and maintain better access to slaughter markets was pooling several different producers’ hogs in a single load and providing such loads on a regular basis,” Kremer said. The co-op serves small- and medium-sized producers who combine...
Barbara Wiand, of Mifflinburg, Penn., retails her farm’s pork product from her back door, offering her an outlet for value-added pork and the opportunity to work from home with her young children close by. After their slaughter plant closed, she organized area pork producers to begin shipping hogs together to another plant, this one 175 miles away. That way, they could meet quota numbers and defray trucking costs.

She and her husband, Glenn, who were both raised on farms, live in a historic house they call the Olde Stonehouse Farm on 240 acres in central Pennsylvania. They raise 300 sows in a confinement crate system; each sow produces 2 1/2 litters per year. In groups of 20 to 25, their piglets remain in pens through finishing. Previously, they sold pork under a contract, but fearing low hog prices and the changing structure of the hog industry would negatively affect their operation, Wiand began looking for ways to cover the risk. Beyond producing 7,000 market hogs per year, Wiand wanted a more rewarding outlet for pork. She began to research a marketing plan for value-added pork products, then used a SARE grant to put the plan into place. “I felt value-added pork would increase farm income, allow us to maintain the same genetics, nutrition and other management strategies to meet quality standards. “If you want a cooperative venture like this to be successful, producers have to communicate from the very beginning,” she said.

With start-up help from a SARE grant, a farmer-owned meat marketing cooperative is netting top dollar for its products and providing its 52-member farms with crucial income. Vermont Quality Meats now sells more than $1,000 a day worth of New England lamb, goat meat, pork, veal, venison and game birds — most of it to upscale New York and Boston restaurants at double regular auction sale prices. The cooperative has put between $100,000 and $150,000 extra profit into the pockets of producers, estimates diversified livestock farmer Lydia Ratcliff.

Cooperative members benefit from both lower production costs and higher sales prices by meeting market demand for significantly younger animals. About 10 part-time jobs have been created through the project, all of which are filled by co-op members, further supplementing farm income. “Our farmers are also getting the reward of knowing they’re producing such fine products that their efforts are being recognized by some of the most distinguished chefs in the country,” Ratcliff said.

Minnesota crop and livestock farmer Carmen Fernholz sells hogs on the conventional market through a buying station that he operates about 10 miles from his family farm. To obtain advance contracts, most producers need to supply 40,000 pounds of carcass, or 225 head, which can carve small producers out of the market.

By pooling their product, the hog producers with whom Fernholz works are able to secure their market price in advance. Between 1997 and 2000, the station served up to 50 farmers in a 30-mile radius. Under the arrangement, farmers let Fernholz know how many head they have to sell. Fernholz then coordinates truck transportation and works with a National Farmers Organization office in Ames, Iowa, to secure a buyer. Farmers bring about 50 to 100 hogs to the buying station for shipping each week.

“We were losing market access, and that was critical,” Fernholz says. “If a group of us can each contribute 20 to 25 head toward a forward contract then we can all price-protect ourselves.”

TASTE
Pork produced from pigs raised on deep bedding proved tastier than pork from confinement animals, a study at
Texas Tech University found. They compared pork loins from a large swine operation that raises pigs on slatted floors versus 20 pork loins in a deep-bedding system, measuring responses from a trained sensory panel. Results, published as an abstract in the *Journal of Animal Science*, indicated that pigs housed on bedding produced pork that was juicier and better tasting. Moreover, carcasses from the deep-bedded group had a lower trim loss – 5.8 percent compared to 14.9 percent for the group raised on slats.

“Historically, consumers’ desires have been fairly simple – to have cheap but wholesome food,” said John McGlone, head of Texas Tech’s Pork Industry Institute. “Now a large segment of consumers is demanding new requirements from the meat they buy.”

**Organic Pork**

Raising pork organically – and marketing it that way – presents another profitable niche. In 2000, USDA announced the final standards for organically grown agricultural products, including practices that can be used in producing and handling organic livestock.

Organic meats appear to be part of a growing niche market. While organic food makes up a small share of retail sales, it is growing by about 24 percent a year. The Food Marketing Institute, an organization representing food retailers and wholesalers, found that 37 percent of consumers look for and purchase products labeled as organic.

All agricultural products labeled “organic” must originate from farms or handling operations certified by a state or private agency accredited by USDA. Farms and handling operations that sell less than $5,000 of organic products per year are exempt from certification. Animals for slaughter must be raised under organic management from the last third of gestation. Producers are required to use certified organic feed, but they may provide vitamin and mineral supplements.

Organically raised animals must not be given hormones or antibiotics. If an animal is sick or injured, producers must not withhold treatment, even if that means administering antibiotics and selling the meat on the conventional market. All organically raised animals must have access to the outdoors, and be confined only for health, safety or stage of production reasons, or to protect soil or water quality.

For more information about organic pork production, see “Resources” p. 16.

**Working Conditions**

Labor, a huge factor in the life of any farmer, takes on a new perspective in hog operations. Toxic gases and associated offensive odors from manure produced as part of a confined system remain a major concern, while producers trying alternative housing systems report few or no problems.

“There’s no comparison,” said Mark Moulton, a Rush City, Minn., swine producer who uses a deep straw system. In a hoop barn, “there’s no runoff, there are no lagoons and no gases. The smell doesn’t compare.”

When Moulton’s neighbors saw him building hoop barns, they were concerned about pungent odors wafting across their fields. Over the past few years, however, they have found their fears groundless. Moulton invited them and others to a picnic 10 feet from his hoop house.

“You couldn’t smell a thing,” he said.

For producers, working with animals directly can be more rewarding than shoveling grain to pigs in crates. The systems require more attention and pig handling, which many producers relish.

“It’s relatively easy, the pigs will teach you how to do it,” Honeyman said, “and it can be rewarding if you like working with animals.” Hogs, which Honeyman said may be smarter than dogs, are fun to work with.

Alternative swine production systems are for people “who like managing animals rather than equipment and machinery,” he continued. “One reason people raise animals is because they want contact with them. In confinement, we’ve automated ourselves into managers of the system rather than working animals.”

Dwight Ault, who has raised hogs for more than four decades, genuinely enjoys working with pigs. Once he switched to winter farrowing in a deep-straw system, he found he could hone his husbandry skills.

“It’s wonderfully productive,” he said of the system. “It gives me more time with the hogs and a chance to observe.”
**Health**

Research has turned up potentially troubling information about the health of workers in confinement systems. David Schwartz, a University of Iowa pulmonary specialist, and other researchers found that workers were prone to upper respiratory disorders from lungs inflamed from exposure to grain dust, airborne particles of fecal matter, and other debris and gases such as ammonia, hydrogen sulfide, carbon dioxide and carbon monoxide from hog manure in confinement barns.

Workers in confinement buildings have greater incidence of acute respiratory illness – with symptoms such as coughing, sore throats, runny noses, burning or watering of eyes, shortness of breath and wheezing, chronic bronchitis, and inflammation, wrote Kelly Donham of the Iowa Center for Agricultural Safety and Health in the *Journal of Agromedicine*. Others have reported reduced lung function.

The dust and gases blamed for such ailments are much less prevalent, or nonexistent, in alternatives such as hoop structures or pasture systems. Moreover, alternative system producers do not administer antibiotics for disease prevention. Administering antibiotics to livestock has been blamed for lowering the effectiveness of those medicines for the treatment of human health problems because indiscriminate use encourages the evolution of new strains of bacteria immune to drugs.

**Family and Community Benefits**

Alternative hog production systems provide excellent opportunities for producers to work with other family members and develop relationships with other workers. In some cases, children can check and bed huts, while older children can help with fencing, feeding, watering and bedding. An alternative system also allows family members to work as a team in moving pigs, setting up pastures, placing huts and shelters, laying water lines and feeders and rounding up pigs for weaning or treatments.

Vic Madsen of Audobon, Iowa, who uses hoop houses in his hog production system, told participants at an annual Iowa swine systems conference in 1999, that alternative systems meet the “fun test” in helping producers do a better job.

“This winter, my 15-year-old son helped me put corn-stalk bedding in a hoop with finishing hogs,” Madsen said. “When we were done, he started laughing out loud. One of the pigs had picked up a corncob, had it sideways in his mouth like a big old cigar, and was literally prancing around the building. That pig made chores fun for my son.”

Dwight Ault finds raising pigs on pasture enjoyable as well as profitable and environmentally sound.

“It is a real treat for me and the sows when they are taken to pasture,” he said. “It is good for mental outlook, a kind of therapy that farmers need. To me, it is a joy when you watch sows munching green legumes and grass after a winter of dry feed.”

Small, independent producers also can stimulate local economies. Independent producers use local veterinarians, farm supply stores and feed companies, and pay local truckers to transport their animals. Other businesses may receive indirect support from additional dollars circulating in the local economy.

Profits from an independent producer can multiply three or four times in a community, said University of Missouri rural sociologist William Heffernan. Profits from a corporate or private company-owned farm leave the community almost immediately.

Patchwork Family Farms in Columbia, Mo., brings different segments of society together that are connected by an interest in quality meat or pork raised by independent producers. The co-op, which sells pork from its retail outlet, collects about $3,000 in four hours on sales days. With prices competitive with conventionally raised pork, the co-op is able to serve both low-income and affluent residents.

“You’ll see a homeless shelter resident, a doctor in a suit and a university professor, and they’re all standing in line talking,” said Lindsay Howerton, the co-op’s marketing coordinator. “We know this is something special, because usually these people wouldn’t interact. They’re all talking about where their food comes from.”

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*Photo by Kathy Dutro, Indiana Farm Bureau*
Alternative Swine System Resources

GENERAL INFORMATION
Sustainable Agriculture Research and Education (SARE) program USDA, 10300 Baltimore Avenue BARC West, Bldg. 046, Beltsville, MD 20705; sare@sare.org; www.sare.org
SARE studies and spreads information about sustainable agriculture via a nationwide grants program. For specific research findings at www.sare.org/projects/.

Appropriate Technology Transfer for Rural Areas (ATTRA) P.O. Box 3657, Fayetteville, AR 72702; (800) 346-9140; http://attra.ncat.org/ Provides assistance and resources free of charge to farmers and other ag professionals.

Alternative Farming Systems Information Center (AFSIC) USDA National Agricultural Library, Rm 132, Beltsville, MD 20705; (301) 504-6559; afsic@nal.usda.gov; www.nal.usda.gov/afsic Provides on-line information resources, referrals and database searching.

Iowa State University/ Mark Honeyman Honeyman has written many articles on sustainable hog production and is doing research on hoop shelters and Swedish deep-bedded group nursing systems. For alternative swine production systems information and research results: B1 Curtis Hall, Iowa State University, Ames, IA 50011 (515) 294-4621; honeyman@iastate.edu

Minnesota Institute for Sustainable Agriculture (MISA) Alternative Swine Production Systems Program, 385 Animal Science/Vet Med. 1988 Fitch Ave., University of Minnesota, St. Paul, MN 55108; (877) ALT-HOGS; (612) 625-6224; marti067@tc.tc.umn.edu; www.misa.umn.edu/programs/altswine/swineprogram.html

Texas Tech University Pork Industry Institute For a free sustainable outdoor pork production information package, (806) 742-2836 or www.pii.ttu.edu

PUBLICATIONS

A Gentle Way: Sows on Pasture Inspirational testimonials from Minnesota and Iowa hog farmers. Free from Alison Fish Minnesota Department of Agriculture; (651) 296-7686. alison.fish@state.mn.us

An Agriculture that Makes Sense: Making Money on Hogs Describes and analyzes a 50-sow sustainable hog enterprise in Minnesota. $4 to Land Stewardship Project; 2200 4th Street, White Bear Lake, MN 55110; (651) 653-0618; www.landstewardshipproject.org/resources-pubs.html #hogs

Graze A monthly magazine offering production information on dairy, beef, sheep, hogs and poultry. $30 for one year (10 issues). To subscribe or for free sample, contact: Graze, P.O. Box 48, Belleville, WI 53508; (608) 455-3311; graze@mhtc.net; www.grazeonline.com/

Hogs Your Way Options for keeping all sizes of hog production systems profitable and environmentally friendly. Includes profiles of hog farmers successfully using Swedish deep-straw farrowing systems, pasture farrowing and hoop house finishing. $5 plus s/h to Minnesota Extension Service Distribution Ctr, Item07849; (808) 876-8636; www.extension.umn.edu/units/dec/abstract.html?item=07849

The New American Farmer A collection of in-depth interviews with farmers and ranchers across America, including profiles about diversified hog farmers. $10 to Sustainable Agriculture Publications, 210 Hills Bldg, UVM, Burlington, VT 05405-0082; (802) 656-0484; sanpubs@uvm.edu; www.sare.org/newfarmer

Swine Breeding, Gestating & Housing Series. MidWest Plan Service, (800) 562-3618; www.mwps.org/catalog.html, click on “Livestock.”

Swine Source Book: Alternatives for Pork Producers A collection of research and demonstration articles that focus on hoop structures, Swedish deep bedding, pasture systems, low antibiotics and marketing. $30 plus s/h from Minnesota Extension Service Distribution Ctr, Item#07289; (808) 876-8636; www.extension.umn.edu/units/dc/abstract.html?item=07289

The Stockman Grass Farmer This monthly magazine is devoted to the art and science of turning grass into cash flow. $32/year. To contact: The Stockman Grass Farmer, P.O. Box 2300, Ridgeland, MS 39158; (800) 748-9808; www.stockmangrassfarmer.com

WEB SITES, LISTSERVS AND E-PUBS
Swine-L Hosted by the University of Minnesota and maintained by the staff of Swine Health and Production, a journal published by the American Association of Swine Veterinarians. MISTA/swine-l.html

SARE works in partnership with Cooperative Extension and Experiment Stations at land grant universities to deliver practical information to the agricultural community. Contact your local Extension office for more information.

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Caring for New Feeder Pigs

G. Pirelli

People purchase feeder pigs to raise for home use, market, or as a 4-H or FFA project for summer fairs. By following a few key recommendations, you can keep your pigs healthy and gaining weight. This publication briefly discusses housing, feeding, and health.

Housing
The first thing to do is to prepare the pen prior to the arrival of the pigs. A clean, draft-free area is important to prevent the animals from becoming stressed after arrival. Shelter from rain and snow is important if the pen is located outside. If the pen has housed hogs previously, clean and disinfect it with a product labeled for use in barns that will kill both viruses and bacteria.

The pen(s) should provide adequate space for all of the pigs to be purchased. In general, pigs that weigh less than 40 pounds should have between 3 and 4 square feet per head, while pigs weighing more than 150 pounds need at least 8 to 10 square feet each.

Once the pigs arrive, supplemental heat, bedding, or hovers may be necessary to keep them warm. The ideal temperature range for a 50-pound pig is 70 to 82°F. The optimum range for a pig over 215 pounds is 50 to 75°F. Feeder pigs can become stressed and ill if they get too cold during the chilly nights that are common in Oregon in April and May.

Heat lamps often are used to keep pigs warm, but extreme caution must be used to prevent a fire. Bedding and floor pads work well. Hovers can be used to conserve heat in a smaller area. A hover is a boxlike structure that captures heat and reduces drafts. This simple box can be placed in a farrowing crate or nursery pen. One side of the hover is open so that young pigs can get inside.

Feeding
Clean water is necessary, as is a palatable, complete feed. Swine are raised on a variety of feeds, ranging from commercial swine rations to by-products such as bakery waste. Average daily gains vary according to the quality of the feed.

Because of their simple, monogastric stomach, pigs require more concentrates (grain) and less roughage or fiber (hay) than cattle or sheep. This is especially true for young pigs. Most quality commercial starter and grower rations for swine contain no more than 5 percent crude fiber.

Protein and energy are important nutrients. Ten- to 20-pound pigs require a crude protein level of at least 20 percent; 25- to 45-pound pigs need 18 percent protein; and 45- to 150-pound animals need at least 16 percent protein. Pigs weighing more than 150 pounds need at least 14 percent crude protein.

Pigs also require higher quality protein than cattle or sheep. Amino acids, called the “building blocks of protein,” are important components of swine feeds. Commercial swine feeds should contain amino acids or highly digestible protein sources rich in amino acids.

Energy from grains is also important for swine. Corn has the highest energy content of any grain, followed by wheat, barley, and finally oats. Whole grains processed into swine feeds provide more energy than grain by-products or grain parts because they contain more starch.

The tag on a sack of commercial feed provides important information about the quality of the feed. Look on the tag to determine the following items:
- Crude fiber of 5 percent or less
- The percent protein of the feed
- Either a protein source rich in amino acids such as soybean meal or added amino acids such as lysine or methionine (listed in the ingredients)
- The source of energy—corn, wheat, barley, or oats (listed in the ingredients)
- Medications and withdrawal times

Pigs fed a good-quality feed require about 2.5 to 3 pounds of feed for each pound of gain. They should gain from 1.5 to 2 pounds per day.
When buying pigs, it is important to ask the seller what the pigs are being fed at the time of purchase so that you can duplicate the diet as closely as possible. If you want to change the diet, introduce the new feed gradually to avoid digestive upsets. If diarrhea becomes a problem, the addition of 20 percent ground whole oats into the diet for several weeks may help. Other remedies that may be used to prevent scour problems include adding 10 percent high-quality alfalfa hay or other fiber to the ration, providing adequate feeder space for all pigs if not on a self-fed system, minimizing stress from cool temperatures, and practicing good sanitation.

Health

The major health problems affecting newly purchased pigs, in addition to scours, are respiratory diseases. Observe animals daily for any signs of illness or unusual behavior. Some symptoms to watch for are coughing, a rise in body temperature, loss of appetite, and difficult breathing.

Be prepared to act immediately at the first sign of illness. If a pig seems to be sick, use a thermometer to take its temperature. The normal temperature for a pig is 102.5°F (plus or minus 1 degree). By knowing the pig’s temperature, a veterinarian will be better able to prescribe a course of treatment.

A vaccination program is encouraged in order to protect your pigs’ health. The basic vaccinations for feeder pigs are atrophic rhinitis (bordetella), actinobacillus pleuropneumoniae (APP), mycoplasmal pneumonia, and swine erysipelas.

Vaccines contain “safe” microorganisms that are injected into a pig to prepare its immune system to resist diseases. The safe microorganisms in vaccines are either killed or modified-live. This means they will activate the immune system but not cause the disease. A vaccination raises the pig’s immunity level by increasing its available antibodies to fight disease.

Second and third vaccinations for the same disease are called boosters. Boosters help to further increase the immunity level. Boosters are required for many vaccinations to be effective. Follow the vaccine label instructions for the timing of boosters.

In order to be effective, vaccines must be administered properly. Use the proper needle size for the age of the pig and the type of injection. Do not give injections in the ham, as damage to the ham can occur. Give intramuscular injections in the neck just behind and below the ear. Give subcutaneous injections in the loose flaps of skin in the flank or elbow.

Before bringing the pigs home, ask the seller what vaccinations were already given. This will help you decide what other vaccinations or boosters are needed.

It is especially important that show pigs have boosters prior to a fair or show. It takes from 10 to 21 days after vaccination for the pig to develop a protective immune response. The exact length of time depends on the pig’s age, the type of vaccine, and whether the pig has been vaccinated before.

It also is important to treat pigs for internal and external parasites. In many cases, sanitation, proper feeding, and comfortable housing will reduce the potential for serious disease outbreaks.

As the pigs grow and summer arrives, be sure to provide plenty of water, shade, and adequate ventilation. Excessive heat can stress pigs as much as cold does.

For more information

Raising a few feeder pigs to market weight might sound like a lot of work and worry, but it also can be fun and rewarding. If you have questions, seek advice from the Oregon State University Extension Service, a veterinarian experienced in swine health, or an experienced swine producer in your area.

OSU Extension publications


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Pork Industry Handbook. Available from Ag Communication/Media Distribution Center, Purdue University, 231 S. University St., West Lafayette, IN 47907-2064; fax: 765-496-1540; e-mail: Media.Order@ces.purdue.edu

Pork Quality Assurance Program Workbook. Available from the National Pork Board, P.O. Box 9114, Des Moines, IA 50306; phone: 515-223-2600; e-mail: porkboard@porkboard.org; Web: http://www.porkboard.org/Home/default.asp

Swine Care Handbook. Available from the National Pork Board, P.O. Box 9114, Des Moines, IA 50306; phone: 515-223-2600; e-mail: porkboard@porkboard.org; Web: http://www.porkboard.org/Home/default.asp

Web sites

National Pork Board: http://www.porkboard.org/Home/default.asp
Oregon State University Department of Animal Sciences Swine Extension program: http://oregonstate.edu/dept/animal-sciences/swineext.htm

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This publication contains suggested vaccinations and health practices for pork producers in Oregon regardless of whether it is a commercial herd, small part time operation or a youth project. The old saying “an ounce of prevention is worth a pound of cure” really describes the value of a good swine health program.

Consultation with a veterinarian that is knowledgeable in swine diseases is helpful when developing a swine vaccination and health program.

Swine producers should vaccinate their pigs to prevent or decrease economic loss from important infectious diseases. Paying 25 to 50 cents per dose of a vaccine is much better than ending up with a 200 dollar dead pig.

Microorganisms such as bacteria or viruses cause infectious diseases. When a pig is exposed to a microorganism, antibodies are produced. Antibodies are substances produced in the pig’s body as a reaction to invasion by that microorganism. Antibodies are specific to a disease and help to fight that disease. These antibodies are part of the immune system in the pig. Immunity is the resistance to disease as a result of the production of antibodies by the immune system. Pigs usually have some antibodies naturally to resist disease. Many times the natural immunity is not high enough to prevent the disease and the animal becomes sick.

Vaccines contain "safe forms" of microorganisms that are injected into a pig to help its immune system resist disease antibodies. These safe microorganisms are either killed or modified-live depending upon the type of disease it will be used against. A vaccination with these safe organisms raises the immunity level by increasing the available antibodies and this helps to prevent the animal from getting sick. This is also called having a high resistance level to disease.

Second and third vaccinations for the same disease are called boosters. Boosters help to increase the immunity level even higher. Boosters are required for many vaccinations to be effective. Follow the vaccine label instructions as to when boosters are recommended.

Antibiotics, such as penicillin or tetracycline, are not vaccines. Vaccines are given to prevent a disease before it occurs. Antibiotics are given to treat a disease which has already occurred.

Pigs should be vaccinated for a disease before they will encounter the microorganisms causing it. It takes from 10 to 21 days after vaccination for the pig to develop a high resistance level. The exact length of time depends on the pig’s age, the vaccine itself, and whether the pig has been vaccinated before. The following chart (figure 1) will help to give you a basic and simple understanding of why animals become sick. As previously discussed, the resistance level is the amount of immunity in the pig.

![Figure One – Healthy Animals](image)

Figure one shows that the resistance level is high because the animals have been vaccinated and have developed immunity to the organism. Along with this, the animals need to be in good overall health and not stressed from poor nutrition or poor housing.

The challenge level is the severity of the disease organisms that the pig may encounter. Animals stay healthy when their resistance level stays above the disease challenge level that they might encounter.
Figure 2 – Why Animals Get Sick

Figure 2 shows what happens when a disease outbreak occurs. The challenge level is increased above the animal’s ability to fight off or resist the disease. Examples of situations when animals will encounter a high disease challenge are:

One situation is when purchased animals are brought home to your farm. Two things can happen. First, the new animals could introduce a disease organism that is not found on your farm and make your pigs sick. Or the new pigs that you purchased might not be resistant to organisms on your farm and get sick.

Another situation is when animals are exposed to other animals at a gathering site such as a sales barn or at any livestock show or display. Not all animals might be immune to the organisms passed around in the barn.

A third situation is when animals are observed to be sick and not separated from the rest of the population.

The best way to keep animals healthy is to raise their resistance level to disease. This is done by vaccination, good nutrition, parasite control and minimizing the stress with good housing and care. It is also helpful to lower the challenge level by isolating newly purchased animals or those brought home from the fair for at least three weeks. This isolation period is important because it prevents any opportunity for the new animals to pass disease causing bacteria or viruses to the other pigs. Since it takes time to build immunity after a vaccination, it is recommended that pigs be vaccinated a minimum of 21 days prior to taking them to a show, feedlot or any new location where there are other pigs.

Vaccinations are not a substitute for good pig management. If a pig’s immune system is weakened by a stressful environment or inadequate nutrition, an overwhelming disease challenge can cause disease even in a vaccinated pig.

Store and handle vaccines according to label directions. Keep them refrigerated or cooled, as required, and out of sunlight. Improper storage can make a vaccine ineffective. Read the label to see what diseases and microorganisms the vaccine is designed to protect against. Make sure that you follow all slaughter withdrawal dates on the label.

Oregon Vaccination Recommendations

The following vaccinations are the ones most commonly used by swine producers in Oregon. Following this vaccination guideline does not guarantee your pigs will be disease free, however, it can reduce the risk of serious losses. Your veterinarian may suggest the deletion of certain vaccines or additional vaccinations to better match the disease risk to your pigs.

All Piglets (Market, Breeding and Show)

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 days</td>
<td>Iron injection or oral iron</td>
</tr>
<tr>
<td>7 days</td>
<td>Vaccinate for atrophic rhinitis, erysipelas and mycoplasma pneumonia if the sow has not been vaccinated</td>
</tr>
<tr>
<td>4 weeks</td>
<td>Repeat vaccinations for atrophic rhinitis, erysipelas and mycoplasma pneumonia or vaccinate if not previously given. Also vaccinate at this time for actinobacillus pleuropneumoniae.</td>
</tr>
</tbody>
</table>
4-10 weeks     Deworm (This depends on weaning date, and when weaning stress is over and when combined with other pigs. Use a fecal test, if possible.

10-12 weeks     Repeat actinobacillus pleuropneumoniae

(Second deworming is optional depending upon environmental conditions. Read withdrawal time required for the dewormer used)

Additional Vaccinations for Gilts, Sows and Show Pigs

Gilts

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccination</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months to pre-breeding</td>
<td>Leptospirosis, parvovirus and atrophic rhinitis</td>
<td>Dewormer</td>
</tr>
<tr>
<td></td>
<td>Repeat vaccinations according to label</td>
<td></td>
</tr>
</tbody>
</table>

Sows

<table>
<thead>
<tr>
<th>Stage</th>
<th>Vaccination</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6 weeks prior to farrowing</td>
<td>Atrophic rhinitis and erysipelas</td>
<td>Dewormer</td>
</tr>
<tr>
<td></td>
<td>Optional vaccinations are Mycoplasmal pneumonia, Transmissible Gastroenteritis (TGE) and E. Coli.</td>
<td></td>
</tr>
<tr>
<td>Prior to weaning or at weaning of litter</td>
<td>Leptospirosis, parvovirus and erysipelas</td>
<td></td>
</tr>
</tbody>
</table>

Show or Project Pigs

<table>
<thead>
<tr>
<th>When</th>
<th>Vaccination</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>At purchase</td>
<td>Ask the seller what vaccinations have been given. The recommended vaccinations should be the same as in the first section for piglet to market.</td>
<td></td>
</tr>
<tr>
<td>Two weeks after purchase</td>
<td>Dewormer</td>
<td></td>
</tr>
</tbody>
</table>

Thirty days Before show     Erysipelas

The vaccination recommendations above are listed as individual vaccinations, but combinations are available and used routinely in the swine industry.

Injecting Vaccines

It is also important to use correct injection techniques. In order to be effective the vaccine must be administered properly. Use the proper needle size for the age of the pig and the type of injection. When using small gauge needles, make sure the animal is properly restrained to avoid breaking the needle. Polyhub (plastic at the base of the needle) needles are more likely to break if the animal is not properly restrained when giving an injection.

The following needle sizes and lengths are recommended by the Pork Quality Assurance Program:

Intramuscular Injections

<table>
<thead>
<tr>
<th>Production Stage</th>
<th>Gauge</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby pigs</td>
<td>20 or 22</td>
<td>5/8&quot; or 1/2&quot;</td>
</tr>
<tr>
<td>Nursery</td>
<td>18 or 20</td>
<td>3/8&quot; or 5/8&quot;</td>
</tr>
<tr>
<td>Finisher</td>
<td>18</td>
<td>1&quot;</td>
</tr>
<tr>
<td>Breeding Stock</td>
<td>16 or 18</td>
<td>1&quot; or 1 1/2&quot;</td>
</tr>
</tbody>
</table>
Subcutaneous Injections

<table>
<thead>
<tr>
<th>Production Stage</th>
<th>Gauge</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery</td>
<td>18 or 20</td>
<td>½&quot;</td>
</tr>
<tr>
<td>Finisher</td>
<td>18</td>
<td>¾&quot;</td>
</tr>
<tr>
<td>Breeding Stock</td>
<td>16 or 18</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

Avoid injections into the ham. Damage to the ham can result in condemnation of the cut at processing time. The Pork Quality Assurance Program recommends intramuscular injections be given in a spot on the neck just behind and below the ear. Subcutaneous injections should be given into the loose flaps of skin in the flank or elbow.

Summary

This publication provides some of the basics of immunity and vaccination in swine along with the types of vaccines that are commonly used by Oregon pork producers. It is recommended that you visit with a veterinarian that is knowledgeable in swine diseases when developing a vaccination program for your swine herd. Remember that along with vaccinations, good management is vital in preventing a disease outbreak. Finally, a sound vaccination program does not cost; it pays!

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Figures 1 and 2 are from:

Principles of Animal Biosecurity written by Steve Lewis, MS, Douglas County Extension Educator; Ben Bruce, Ph.D. Livestock Specialist; Ron Torell, MS., Area Livestock Specialist; Bill Kvasnicka, DVM, Extension Veterinarian.

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<td>Bedding</td>
<td>5</td>
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<tr>
<td>Possible Challenges of Feeding Small Grains to Swine</td>
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<td>Barley</td>
<td>6</td>
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<tr>
<td>Oats</td>
<td>7</td>
</tr>
<tr>
<td>Rye</td>
<td>7</td>
</tr>
<tr>
<td>Triticale</td>
<td>8</td>
</tr>
<tr>
<td>Wheat</td>
<td>9</td>
</tr>
<tr>
<td>Guidelines Summary</td>
<td>10</td>
</tr>
</tbody>
</table>
Introduction
Small grains, such as barley, oats, rye, triticale, and wheat can be useful feedstuffs in swine feeding programs. In many instances, pigs fed well-balanced small grain-based diets can perform as well as those fed corn-based diets. Nutritionally, small grains are similar to corn in some aspects, but there are differences depending on the grain. Small grains are higher in crude protein than corn and, more importantly, they are higher in lysine, the first limiting amino acid in cereal grain-based swine diets. Small grains are also higher in digestible phosphorus than corn, but tend to be lower in energy content.

When viewed in the context of an integrated crop and livestock system, several additional attributes also make small grains attractive. Addition of an extra crop to the corn-soybean rotation typical of the U.S. Corn Belt can reduce costs, improve distribution of labor and equipment, improve yields of corn and soybeans, provide better cash flow, and reduce weather risks. Lengthening the time between crops on the same ground can decrease the prevalence of some pests, most notably soybean cyst nematode and corn rootworm. Straw from small grains is an excellent source of bedding that becomes available in the late summer when corn stalks stored since the previous fall may be in poor condition. Small grains also provide environmental benefits, such as erosion control and improved nutrient recycling.

Proper grain testing and diet formulation are important aspects of maximizing the performance of small grains as swine feed. Growing and harvesting conditions can greatly influence the nutritional composition of small grains even within the same variety. Testing for lysine concentration is especially important because improper protein supplementation is a major cause of problems when feeding small grains.

The first section of this publication provides information and guidelines common to inclusion of barley, oats, rye, triticale, and wheat in swine diets. The middle section contains information specific to the feeding of each small grain species to the various classes of swine. The last section contains summarized guidelines for including small grains in swine diets. The information should be consulted carefully as some small grains should only be fed in limited amounts in certain situations. University swine extension specialists
and company-based or independent swine nutritionists can be contacted for more information on feeding small grains to swine.

**Nutrient Composition of Small Grains**

Small grains contain more crude protein than corn and greater levels of several essential amino acids, including lysine, threonine, and tryptophan (Table 1). The higher lysine concentration in small grains is especially important. Lysine is the first limiting amino acid in many swine diets, so balancing the diet on the basis of lysine content usually provides adequate levels of the other essential amino acids. Compared to corn, small grains contain 30 to 50% more lysine, which reduces the need for soybean meal in small grain-based finishing diets by about 100 lb/ton. This increases the feed value of small grains relative to corn by 5 to 7%. Lysine concentration is the most important consideration when balancing small grain-based swine diets with protein or amino acid supplements. Balancing on crude protein alone is often ineffective because the amount of lysine relative to protein varies among small grains and corn. If lysine concentration is unknown, substituting small grains for corn on an equal weight basis would be a conservative approach for constituting swine diets.

The phosphorus (P) in small grains is more available to swine than that in corn, which provides both economic and environmental benefits. Even though cereal grains contain significant amounts of P, much of it is chemically bound within phytate. Since pigs lack the enzymes needed to remove P from phytate, inorganic P must be added to the diet to meet the pig’s requirement for this mineral. Dicalcium phosphate, the most common P source, is an expensive ingredient. Feeding grains with more available P reduces the amount of inorganic P supplementation in the diet, which minimizes negative environmental impacts connected with excessive P in swine manure. Most of the phosphorus locked in phytate is excreted in the manure and makes its way into streams and lakes if it is spread on erodible farmland already high in soil P. Since the P in small grains is more available than that in corn, there may be up to 30% less P secreted by animals fed small grains. Phosphorus availability is 10 to 15% in corn, 20 to 30% in barley and oats and 45 to 50% in triticale and wheat.

Small grains are lower in fat, higher in fiber, and typically contain less metabolizable energy than corn (Table 1). Rye, triticale, and wheat contain 5 to 10% less energy than corn, but these differences do not appear to have negative effects on average daily gains when fed in finishing diets. In many studies, these grains have successfully replaced 100% of the corn used in control diets. The lower energy has affected feed efficiency in some instances because pigs on small grain diets ate more than pigs on corn-based diets. When palatable, pigs generally consume higher amounts of small grains to meet their energy requirements. Barley and oats have

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**Table 1. Average analysis of cereal grains as swine feed (data on as-fed basis)*.**

Source: NRC Nutrient Requirements of Swine, 1998

<table>
<thead>
<tr>
<th></th>
<th>Barley, six row</th>
<th>Corn</th>
<th>Oats</th>
<th>Rye</th>
<th>Triticale</th>
<th>Hard red spring wheat</th>
<th>Hard red winter wheat</th>
<th>Soft red winter wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry matter (%)</td>
<td>89.0</td>
<td>89.0</td>
<td>89.0</td>
<td>88.0</td>
<td>90.0</td>
<td>88.0</td>
<td>88.0</td>
<td>88.0</td>
</tr>
<tr>
<td>Crude protein (%)</td>
<td>10.5</td>
<td>8.3</td>
<td>11.5</td>
<td>11.8</td>
<td>12.5</td>
<td>14.1</td>
<td>13.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Lysine (%)</td>
<td>0.36</td>
<td>0.26</td>
<td>0.40</td>
<td>0.38</td>
<td>0.39</td>
<td>0.38</td>
<td>0.34</td>
<td>0.38</td>
</tr>
<tr>
<td>Methionine (%)</td>
<td>0.17</td>
<td>0.17</td>
<td>0.22</td>
<td>0.17</td>
<td>0.20</td>
<td>0.23</td>
<td>0.20</td>
<td>0.22</td>
</tr>
<tr>
<td>Threonine (%)</td>
<td>0.34</td>
<td>0.29</td>
<td>0.40</td>
<td>0.32</td>
<td>0.36</td>
<td>0.41</td>
<td>0.37</td>
<td>0.39</td>
</tr>
<tr>
<td>Tryptophan (%)</td>
<td>0.13</td>
<td>0.06</td>
<td>0.16</td>
<td>0.12</td>
<td>0.14</td>
<td>0.16</td>
<td>0.15</td>
<td>0.26</td>
</tr>
<tr>
<td>ME (kcal/kg)</td>
<td>2,910</td>
<td>3,420</td>
<td>2,710</td>
<td>3,060</td>
<td>3,180</td>
<td>3,250</td>
<td>3,210</td>
<td>3,305</td>
</tr>
<tr>
<td>NDF (%)</td>
<td>18.6</td>
<td>9.6</td>
<td>27.0</td>
<td>12.3</td>
<td>12.7</td>
<td>–</td>
<td>13.5</td>
<td>–</td>
</tr>
<tr>
<td>ADF (%)</td>
<td>7.0</td>
<td>2.8</td>
<td>13.5</td>
<td>4.6</td>
<td>3.8</td>
<td>–</td>
<td>4.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Calcium (%)</td>
<td>0.06</td>
<td>0.03</td>
<td>0.07</td>
<td>0.06</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
<td>0.39</td>
</tr>
<tr>
<td>Phosphorus (%)</td>
<td>0.36</td>
<td>0.28</td>
<td>0.31</td>
<td>0.33</td>
<td>0.33</td>
<td>0.36</td>
<td>0.37</td>
<td>0.39</td>
</tr>
<tr>
<td>Bioavailability (%)</td>
<td>30.0</td>
<td>14.0</td>
<td>22.0</td>
<td>–</td>
<td>46.0</td>
<td>–</td>
<td>50.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

*a dash indicates that data are not available*
higher fiber content than other small grains because the kernels are encased in a hull. The higher fiber content of barley does not appear to negatively affect gains in growing-finishing swine if plump, high-test weight grain is fed. However, high fiber content lowers oats’ feed value to about 80% of that of corn. Lower energy limits the use of oats to only a portion of swine diets, but the high fiber can be useful for adding bulk to the diets of gestating sows.

Barley and oats also have relatively high heat increment content. Heat increment is the increase in heat production from digestion of feed. High heat increment of a feedstuff can help keep an animal warm in cold environments, hence feeding oats and barley during the winter may be advantageous. However, in hot conditions, feeding oats and barley may decrease feed intake, because the additional heat generated by the fibrous feeds is not needed by the animal.

**Bedding**

Straw from small grain makes excellent bedding for pigs. Oat straw is one of the most absorbent bedding types commonly available. Oat straw is about 10% more absorbent than pine saw dust or shredded corn stalks. Wheat and triticale straw are about 25% less absorbent than oat straw. Barley straw is about 33% less absorbent than oat straw. Good straw should be clean, bright, and free of mold or dust. Shredded barley straw is preferred for floating biocover for manure storage structures. Because straw is an important economic component of a small grain crop, it should be harvested in a timely manner.

**Possible Challenges of Feeding Small Grains to Swine**

**Ergot.** Ergot is most common in rye, and is only occasionally found in barley, oats, and wheat. This does not mean it cannot be a problem in these grains under certain conditions. A serious ergot infestation of barley occurred in northeast Iowa in 1996. Rye is particularly susceptible to ergot infestation and should be fed with extreme caution. Ergot is caused by a fungus that regularly infests wild and cultivated grasses in Iowa and other humid areas. Ergot produces dark purple to black sclerotia (bodies) that replace the grain in the heads and contaminate the harvested grain. Grain with more than 0.1% ergot sclerotia (about 1 body in 1000 kernels) should not be fed to growing-finishing swine unless it is diluted to lower levels with ergot-free grain. Ergot concentrations above this level can reduce feed intake, slow growth, and reduce feed conversion. If fed at levels that are too high, ergot can even cause death. Grain containing any ergot should not be fed to breeding stock.

Ergot sclerotia contain alkaloids, which stimulate contraction of small blood vessels. Early symptoms of ergot poisoning include animal lameness, usually in the hind limbs, appearing a few weeks after first ingesting ergot. Continued ergot consumption results in gangrene and sloughing of tissue extremities such as the nose, ears, tail, and limbs. Ingestion of very low levels of ergot by lactating animals markedly reduces, and may stop, milk production. Occasionally ergot alkaloids affect the animal’s nervous system causing convulsions and staggering.

Symptoms vary with ergot alkaloid content, amount ingested, frequency of consumption, and the climatic conditions during sclerotia growth. Some ergot sclerotia are similar to the grain kernels in size, while others are larger. A large size difference between the sclerotia and the grains allows for removal of the ergot bodies with grain cleaning equipment.

In triticale research at Iowa State University, ergot levels varied greatly with variety and growth environment. In most cases, ergot levels were not problematic in winter triticales. However, most spring varieties had ergot levels near or greater than 0.1%. AC William was the only spring triticale variety with ergot levels as low as wheat. Ergot is most prevalent in areas and seasons with wet soil surface conditions during spring and early summer combined with rainy weather during flowering.
To minimize ergot infestation, select low ergot varieties and avoid planting small grains in fields that contained pasture or forage grasses the previous growing season.

**Scab.** All small grains can be infected with the fungus *Fusarium graminearum* resulting in what is commonly called scab. With severe *Fusarium* infection, the grain becomes shriveled and takes on a chalky white or pink appearance. Scab is most likely to occur under cool, wet weather during early summer. Scabby grain can contain unacceptable levels of deoxynovalenol (DON) or vomitoxin, a mycotoxin associated with feed refusal in swine. Pigs fed diets having harmful DON levels will gain slowly and have poor feed efficiency. Contaminated grain should not be fed to gestating or lactating sows or pigs weighing less than 50 lb. For growing-finishing swine, contaminated grain may be blended with non-contaminated grain to reduce the DON concentration below 1 ppm, usually a no effect level. Cattle and other ruminants may be better alternatives for feeding scab infested small grains because they are less sensitive to DON than swine.

![Fusarium graminearum (scab) infection causes small grain kernels to shrivel and take on a chalky white or pink appearance. The kernels in the row at the top of the picture are infested with scab. The bottom row contains normal kernels.](image)

**Enzyme inhibitors.** Some varieties of rye and triticale contain excessive levels of antinutritional compounds that interfere with the activity of trypsin and chymotrypsin, enzymes that assist the digestion of proteins. Inhibition of these enzymes reduces gain, diminishes muscle growth, and negatively affects pancreatic health. Trypsin inhibitor levels vary widely among rye and triticale genetic lines. Newer triticale varieties have acceptable trypsin inhibitor levels, thus their use in swine diets should not be limited by these factors.

**Low-test weight.** Less than ideal growing and harvesting conditions can lower small grain test weight. Low-test weight grain has higher fiber content and lower energy density than high test weight grain. Pigs fed low-test weight grain may gain poorly or have poorer feed efficiency versus those fed high test weight grain. Test weight differences may account for the variability in pig performance found among oat feeding trials. It has been commonly accepted that oats should not constitute more than 20% of a growing-finishing pig diet. However, research with high-test weight oats (at least 36 pounds per bushel) at Iowa State University found that oats could make up 40% of the diet without affecting pig performance. Low-test weight oats are best used as a feedstuff in gestating sow diets or as a small percentage of finishing diets where feed intake usually is not the limiting factor.

**Barley**

Most Corn Belt swine producers have limited experience with barley and are unaware of its wide use in other parts of the U.S. and the world. While millions of pigs are fed annually on barley-based diets, there is great variability in the types of barley used for swine feeding programs. Barley can be two-rowed or six-rowed and hulled or hulless. These differences between barley types can equate to notable differences in growth rates, feed intake, and feed efficiency. Two-rowed barley produces fewer, but larger kernels per plant than six-rowed barley, so it generally has better feed efficiency, but lower grain yields per acre. Hulless barley has higher crude protein and lower crude fiber than hulled barley, as the hull contains a large portion of the crude fiber.

Barley is particularly well suited in growing-finishing diets since feed intake is usually not a limiting factor and pigs are able to perform as well as on corn-based diets. An Iowa State University study found pigs fed barley-based diets tended to have a higher quality fat (more firm and less susceptible to rancidity and off flavors) than those fed corn-based diets. The pigs’ performance was statistically identical for corn-based and barley-based diets. Even though the barley-based diets were lower in energy than corn-based diets, pigs were able to compensate by eating more. They will simply eat enough to meet their energy requirements. Even so, producers...
may find it advantageous to use barley in combination with higher energy grains, such as corn or wheat. Barley can also be used as the sole cereal grain in sow diets during gestation. However, low energy density suggests limiting the use of barley to 85% of the cereal grain in lactating sow and 25% in weanling pig diets unless it is pelleted.

**Oats**

Oats can be an effective addition to swine diets, but there are limits on the amount that can be fed. Although oats are very palatable, they have more fiber content and lower energy density relative to corn and other small grains. The high crude fiber content makes oats desirable for gestating sow diets where limiting energy intake is beneficial for maintaining reproductive health. Oats may compose up to 90% of the diet in this situation. Small pigs and lactating sows have difficulty consuming enough feed to meet their energy requirements when oats are more than 5% of the diet. However, high-test weight oats (greater than 36 lb/bu) can be used for up to 5% of the diet for weanling pigs and 15% for lactating sows.

Oats can compose up to 20 to 40% of the diet of growing-finishing swine. A study in deep-bedded hoop barns at Iowa State University found no differences in animal performance or carcass measurements when oats replaced 20 and 40% of the corn in a swine finishing diet.

Oats are often added to swine diets for reasons other than energy. At 5 to 15% of the diet, oats can help minimize diarrhea problems common in recently weaned and small feeder pigs. Oats can also protect against constipation in sows and ulcers in growing pigs. Oats should be finely ground to prevent the pigs from separating out the hulls.

**Rye**

Rye acreage harvested for grain production in North America is fairly small relative to barley, oats, and wheat. Rye is most commonly grown for bread and whiskey production with a small amount fed to livestock. Rye’s market potential is limited by the perception that it contains toxic factors that reduce its nutritive value. While some reasons for this discrimination are valid, many are unfounded. Rye is particularly susceptible to ergot infection, which is a major concern with frequent rainfall during spring and early summer. Since these conditions are prevalent in most corn growing regions, extreme caution should be used when feeding rye produced in these areas.
It is recommended that ergot-free rye be substituted for no more than 50% of the corn in a growing-finishing diet. Dustiness may be a problem with rye. A coarsely ground meal or the addition of fat or vegetable oil will reduce the problem. Rye is not recommended as a feedstuff for weanling pigs as it may be of lower palatability. Because maximum feed intake is critical for nursing sows, rye should not be fed to lactating sows either. Very little rye feeding research has been conducted with breeding stock. If rye is to be included in the diet of sows it must be ergot-free.

**Triticale**

Triticale (trit-ah-kay-lee) is a synthetic small grain produced by crossing durum wheat with rye. Triticale varieties typically contain the combination of the high crude protein and digestible energy of wheat and the hardiness, disease resistance and protein quality of rye. In most production environments, triticale yields are superior to both wheat and rye making it a practical and economical feedstuff.

The first triticale varieties, released in the late 1960s and early 1970s, had multiple traits that made them poorly suited for grain production, including poor standability, shriveled grain, and ergot susceptibility. However, the vigorous growth and high biomass production of triticale has led to its adoption as a forage crop that now occupies as many as one million acres in the U.S. Several breeding programs have continued developing grain-type triticaces and great progress has been made toward eliminating problematic traits. Improvements have been significant enough that triticale varieties now occupy a sizeable production area in Australia and northern Europe, where the grain is used for livestock feed. Triticale has not been widely grown or fed to livestock in North America, but evidence suggests that it has potential. In studies from Florida, Georgia, North Carolina, and Canada, growing and finishing pigs fed triticale performed similarly to pigs fed corn-based and barley-based diets when they were balanced for lysine concentration with soybean meal or synthetic lysine.

The apparent high feed value and high yields of triticale recently led a group of researchers at Iowa State University to begin exploring the possibilities of including triticale into Corn Belt crop and swine feeding systems. This research includes testing of winter and spring triticale varieties; expanded three and four crop rotations with corn, soybean, triticale, and forage legumes; triticale planting management; soil quality analysis; and swine feeding trials. At least one spring triticale variety has been identified with grain yields near 100 bu/acre and several winter triticale varieties with yield potentials above 100 bu/acre. The economics of producing spring triticale compared well with oats and the economics of winter triticale compared favorably with corn and soybean production.

Testing has shown considerable variation among triticale varieties in agronomic traits, ergot susceptibility and nutrient composition. Therefore, it is critical to know the variety and its traits when growing triticale and using it in swine diets. Like rye, some triticaces are susceptible to ergot. Ergot-infested triticale should not be fed to the breeding herd and triticale with ergot above 0.1% should not be fed to growing-finishing swine without diluting it with other grains. Since wheat is quite tolerant to ergot fungus, screening during the plant breeding process has allowed for the selection and development of triticace varieties with low ergot susceptibility.

The triticace varieties in Table 2 have been identified as having low ergot levels, high yields, and good agronomic characteristics when grown in Iowa. Several of these varieties should be available within Iowa and surrounding states. Although widely available, forage triticale varieties generally make poor choices for grain production because they are later-maturing, have lower yields, and are more susceptible to ergot than grain varieties. Older varieties may contain levels of trypsin.

<table>
<thead>
<tr>
<th>Winter varieties</th>
<th>Spring varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzo</td>
<td>AC William</td>
</tr>
<tr>
<td>Décor</td>
<td></td>
</tr>
<tr>
<td>Kitaro</td>
<td></td>
</tr>
<tr>
<td>Lamberto</td>
<td></td>
</tr>
<tr>
<td>NE426GT</td>
<td></td>
</tr>
<tr>
<td>Presto</td>
<td></td>
</tr>
<tr>
<td>Roughrider</td>
<td></td>
</tr>
<tr>
<td>Trimark™ Brand 336</td>
<td></td>
</tr>
<tr>
<td>Trical® Brand 815</td>
<td></td>
</tr>
<tr>
<td>Sorento</td>
<td></td>
</tr>
<tr>
<td>Vero</td>
<td></td>
</tr>
</tbody>
</table>
and chymotrypsin inhibitors inherited from its rye parent. Most recently developed varieties have acceptable levels of these antinutritional factors. Feed refusal has been observed in a few swine feeding trials with triticale. Crop producers are advised to get variety information on agronomic characteristics, ergot tolerance, and feed performance before planting triticale. Swine producers are advised to try triticale diets with small groups of pigs before committing to unknown sources or varieties.

Limited triticale feeding research has been done on starter diets. One study found that triticale could replace all of the corn and about 10% of the soybean meal in starter pig diets balanced for lysine without influencing daily gain or feed intake. However, another study showed lowered feed intake and palatability problems with triticale. Currently, Iowa State University recommends including triticale at a maximum of 25% of starter pig diets until more research is conducted on varieties with agronomic potential in our region.

As mentioned earlier, several studies have found that growing-finishing pigs receiving a triticale-based diet, balanced for lysine, did not differ in daily gain versus pigs receiving corn-based diets. Triticale feeding research is currently being conducted at Iowa State University on varieties suitable for grain production in Iowa. Triticale grain is being fed at 0, 40, and 80% of the total diet weight to growing-finishing pigs housed in deep-bedded hoop barns. Pigs fed a diet of Trical® 815, a winter triticale, and soybean meal had daily gains and meat quality similar to pigs fed a corn/soybean diet. However, pigs fed triticale ate more feed resulting in slightly poorer feed efficiency than those fed a corn-based diet.

Research with triticale in breeding herd diets has not been reported. Until more research is conducted to determine the nutritive value of triticale for breeding stock, a limit of 25% of the total diet is suggested.

**Wheat**

Wheat is grown primarily for human food and used in livestock diets only when it is economical. When viewed in the context of cash grain markets, wheat appears to be an expensive feed grain in the Corn Belt. It often brings a substantially higher price per bushel than corn and most wheat is produced outside the region, which makes transportation costs a deterrent to its use. However, wheat
can have a positive role in integrated crop-livestock system when it is fed on or near the farm where it is produced. When viewed within this perspective, wheat becomes a much more desirable option in the Corn Belt. Wheat can be used as the sole cereal grain in growing and finishing swine diets. It is recommended that wheat occupy no more than 85 to 90% of the diet for the breeding herd and 45% of small pig diets.

Wheat classes produced in the U.S. include hard red winter, hard red spring, soft red winter, hard white, soft white, and durum. From both grain production and animal feed perspectives, hard red winter and soft red winter are best suited for the Corn Belt. Hard red spring may be more desirable than the winter wheats for some areas of the northern Corn Belt where winter injury to the crop may be of concern. From an animal feed perspective, there are few differences between red or white wheats. However, the relatively high rainfall conditions of the Corn Belt can cause preharvest sprouting in white and durum wheats. There are slight differences between hard and soft wheats. Hard wheat tends to have more protein, a higher content of essential amino acids (though a slightly less desirable profile), and less energy than soft wheat. However, feeding trials of soft and hard wheat have generally found equal performance in growing-finishing pig diets. Differences in feeding values for wheat are more attributed to variation in growing or harvesting conditions than differences among classes or varieties. Therefore, for wheat as well as all small grains, the grain should be sampled and analyzed by proximate analysis for moisture, crude fat, crude protein, and crude fiber. It is also recommended to analyze a sample for available lysine and phosphorus.

**Guidelines Summary**

Small grains, such as barley, oats, rye, triticale, and wheat can be useful feedstuffs in swine feeding programs. In many instances, pigs fed well-balanced small grain-based diets can perform as well as those fed corn-based diets. Most small grains can be fed to all types of swine – sows, piglets, and finishing pigs. Table 3 shows recommended inclusion rates of small grains for various swine phases (gestating sows, starter pigs, and growing-finishing pigs). The relative value of each small grain relative to corn is provided.

### Table 3. Recommended inclusion rates of small grains in various swine diets and their relative value compared to corn.

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>Gestation</th>
<th>Starter</th>
<th>Grow-Value Finish vs Corn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triticale</td>
<td>0-90</td>
<td>0-25</td>
<td>0-95 vs 90-105</td>
</tr>
<tr>
<td>Barley</td>
<td>0-90</td>
<td>0-25</td>
<td>0-95 vs 100-105</td>
</tr>
<tr>
<td>Oats</td>
<td>0-90</td>
<td>0</td>
<td>0-40 vs 80-85</td>
</tr>
<tr>
<td>Wheat, hard</td>
<td>0-90</td>
<td>0-45</td>
<td>0-95 vs 110-115</td>
</tr>
</tbody>
</table>

Barley, oats, and wheat relative values from Life Cycle Swine Nutrition PM-489, ISU Extension. Relative value vs. corn-based on energy content, lysine %, and available phosphorus. Triticale rates for gestating sows based on barley, oats, and wheat recommendation.

### Table 4. Sample diets for finishing pigs (150-250 lbs.) with a high level or low level of small grain inclusion.

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>high</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triticale or wheat</td>
<td>1769.00</td>
<td>500.00</td>
</tr>
<tr>
<td>Barley</td>
<td>1786.00</td>
<td>500.00</td>
</tr>
<tr>
<td>Oats*</td>
<td>1215.00</td>
<td>1223.00</td>
</tr>
<tr>
<td>Corn</td>
<td>195.00</td>
<td>244.00</td>
</tr>
<tr>
<td>Soybean meal b</td>
<td>175.00</td>
<td>235.00</td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>10.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Limestone</td>
<td>20.05</td>
<td>20.75</td>
</tr>
<tr>
<td>Salt</td>
<td>6.80</td>
<td>6.80</td>
</tr>
<tr>
<td>Mineral premix</td>
<td>6.80</td>
<td>6.80</td>
</tr>
<tr>
<td>Fat soluble</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>vitamin premix</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>B-vitamin premix</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Total, lb.</td>
<td>2000.00</td>
<td>2000.00</td>
</tr>
</tbody>
</table>

*Assumes feeding heavy oats (>36 lb/bu).

b Assumes 47.5% crude protein.
Table 5. Change in pounds of soybean meal and dicalcium phosphate added in one ton of feed for finishing pigs (150-250 lbs.), compared to a corn-soybean meal diet.

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>Inclusion rate, %</th>
<th>Soybean meal</th>
<th>Dicalcium phosphate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triticale or wheat</td>
<td>88.5</td>
<td>-70.00</td>
<td>-12.30</td>
</tr>
<tr>
<td>Barley</td>
<td>89.3</td>
<td>-90.00</td>
<td>-4.90</td>
</tr>
<tr>
<td>Oats</td>
<td>40.0</td>
<td>-40.00</td>
<td>-2.30</td>
</tr>
</tbody>
</table>

Example, including triticale in the diet at 88.5% will decrease the amount of soybean meal needed in one ton by 70.0 lb and the amount of dicalcium phosphate needed by 12.3 lb when compared with a corn and soybean meal-based diet.

Table 6. Sample diets for gestating sows with maximal small grain inclusion.

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>500.00</th>
<th>1800.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triticale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>1800.00</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>1800.00</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>1800.00</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>1430.00</td>
<td>149.00</td>
</tr>
<tr>
<td>Soybean meal</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>31.00</td>
<td>21.50</td>
</tr>
<tr>
<td>Limestone</td>
<td>16.50</td>
<td>21.00</td>
</tr>
<tr>
<td>Salt</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Sow trace mineral premix</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Sow fat soluble vitamin remix</td>
<td>0.35</td>
<td>0.35</td>
</tr>
<tr>
<td>Sow B-vitamin premix</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>Sow folic acid premix</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Choline premix</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Total lb.</td>
<td>2000.00</td>
<td>2000.00</td>
</tr>
</tbody>
</table>

*aTriticale diet based on conservative recommendation (25%), see text.
*bTriticale diet based on barley, wheat, and oats recommendation and probable sow performance.
Zebblin Sullivan
Graduate Research Assistant, Animal Science

Mark Honeyman
Professor, Department of Animal Science

Lance Gibson
Associate Professor, Department of Agronomy

Jean McGuire
Editor, Educational Materials and Marketing Services

Micki Nelson
Designer, Educational Materials and Marketing Services

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Additional Resources
AED 41 Hoop Barns for Grow-Finish Swine
AED 44 Hoop Barns for Gestating Swine
PIH 138 Managing Market Pigs in Hoop Structures

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Many materials can be made available in alternative formats for ADA clients. To file a complaint of discrimination, write USDA, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964.

Additional Resources

Online Resources

ATTRA – National Sustainable Agriculture Information Service
www.attra.org

Agricultural Marketing Resource Center
http://www.agmrc.org/

Hooped Structures for Swine webpage (Iowa State University)
http://www3.abe.iastate.edu/hoop_structures/swine/news.html

Practical Farmers of Iowa – Niche Pork webpage
http://practicalfarmers.org/programs/Niche-Pork.php

US Pork Information Gateway
http://pork.porkgateway.org/web/guest/home

National Pork Board.
http://www.pork.org

Oregon Pork Producers
http://oregonporkproducers.com

Pork Niche Marketing Working Group
http://www.valuechains.org/porkniche/

Oregon State University, Department of Animal Sciences
http://ans.oregonstate.edu/?q=content/swine

Pork Network
http://www.porknetwork.com/

Iowa Pork Industry Center
http://www.ipic.iastate.edu/topics.html

Publications

Niche Pork Production, Peter Lammers et al., Iowa State University, 2007
http://www.ipic.iastate.edu/publications/IPICNPP.pdf

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http://www.usporkcenter.org/Projects/506/NationalSwineNutritionGuide.aspx#.T8UzzdUdNVg

Kansas State University, Swine Nutrition Guide

Designing Feeding Programs for Natural and Organic Pork Production, University of Minnesota Extension, 2002
http://www.extension.umn.edu/distribution/livestocks/systems/components/7736c01.html

Practical Ideas to Address High Feed and Production Costs, Pork Checkoff, 2011
http://www.pork.org/filelibrary/FeedWeb1210.pdf

Marketing
Pork Marketing Alternatives, NCAT, 2004


Hooped Shelters
Hooped Shelters for Hogs, NCAT, 2005

Manure
Swine Manure Management Planning, Purdue Cooperative Extension
http://www.extension.purdue.edu/extmedia/ID/ID-205.html

Enterprise Budgets
Organic Pork Production: A Two Litter Pasture Farrow-to-Finish Budget, Iowa State University

Niche Pork Production, Peter Lammers et al., Iowa State University, 2007
http://www.ipic.iastate.edu/publications/IPICNPP.pdf

Ag Decision Maker, Iowa State University
http://www.extension.iastate.edu/agdm/livestock/html/b1-80.html

Farm Budgets, University of Missouri Extension, 2012
http://agebb.missouri.edu/mgt/budget/
Swine Resources available on-line
at: http://ans.oregonstate.edu/?q=content/swine

National Pork Board: Information on pork production available online and also printed publications.

Pork Industry Handbook: Up-to-date information on pork production available from Purdue University.

Oregon Pork Producers Swine Health - Raising Healthy Pigs Powerpoint presentation by Gene Pirelli.

Care of Newborn Pigs and Post-Farrowing Sows (pdf of PowerPoint) by Charles Estill, DVM, from the OPP Conference, February 2012.

Presentations given by Dr. Peter Lammers of Iowa State University at the October 22, 2011, OPP Conference held at OSU:

(a) Feeding Pigs (pdf)

(b) Efficiency of Niche Pork Production: Lessons from Iowa (pdf)

(c) Alternative Swine Housing and Production: Lessons from Iowa and Beyond (pdf)

Swine Production information:

Oregon Pork Producers Vaccination Brochure (pdf)

Caring for New Feeder Pigs (pdf)

PRRS (Viral Infections) Fact Sheet (pdf)

Vaccinations for pigs: should I jump on the Circovirus 2 bandwagon? (pdf)

Swine Reproduction articles:

Management of Replacement Gilts (pdf)

Nutrition for Reproductive Performance (pdf)

Oregon Pork Producers is the state organization for those interested in pork production.
If you have questions about swine production in Oregon, e-mail: Gene.Pirelli@oregonstate.edu
Meat and Poultry Processing Regulations in Oregon – A Short Guide

Federal law requires that meat and poultry are processed at a federally-inspected facility to be sold as human food. The law contains some limited exceptions allowing the sale of uninspected meat and poultry. However, with only one small exception (discussed below), Oregon law requires that to be sold as food, meat and poultry species, amenable or voluntary, must be processed in a state-approved and state-licensed facility.

WHAT DOES INSPECTED MEAN?

At USDA-inspected slaughter facilities, each animal is inspected, before and after slaughter, by an employee of the USDA Food Safety and Inspection Service (FSIS). For USDA-inspected processors that do not slaughter, the FSIS inspector visits at least daily to assure proper food safety procedures are followed. These are both “continuous inspection.”

The Oregon Department of Agriculture (ODA) licenses all processors, both USDA-inspected and exempt, and inspects all “exempt” facilities that are not “continuously inspected” by USDA. But ODA inspects the facility, not the animals. USDA inspects the health and physical integrity of animals at the time of slaughter. Oregon does not inspect the health and physical integrity of privately owned animals, because they are private property and not for sale. ODA inspection, typically annual, assures compliance with construction, sanitation, liquid and solid waste disposal, and animal theft regulations.

AMENABLE V. VOLUNTARY SPECIES

USDA inspection is required for “amenable” red meat and poultry species: cattle, hogs, sheep, goats, chickens, turkeys, ducks, geese, guineas, and ratites (ostrich, rhea, emu).

Inspection is “voluntary” for other red meat and poultry species: rabbits, bison, domesticated deer, and domesticated quail, squab, pheasant and migratory waterfowl. Domesticated elk are considered “voluntary” by USDA, but in Oregon they must be processed at a USDA plant (Oregon Administrative Rule 603-028-0500).

For example, bison slaughtered and processed by a state-licensed, custom-exempt plant or mobile slaughter truck could be sold at a farmers’ market, to a restaurant, and to a retail store.

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1 Federal Meat Inspection Act (FMIA) and Poultry Products Inspection Act (PPIA). Some states have cooperative inspection programs, equal to federal inspection and overseen by USDA, but Oregon does not.
both interstate and intrastate. But be aware that some buyers, retailers in particular, may elect to buy only USDA inspected meat.

**EXEMPTIONS: WHEN FEDERAL INSPECTION IS NOT REQUIRED**

- **Retail exempt processing**
  Retail establishments, such as grocery stores, may process meat to sell at their own retail storefront and one other store with the same owner, as long as the meat comes from animals slaughtered under federal inspection. A retail exempt processor can also wholesale a limited amount of product to hotel, restaurant, or institutional customers as long as the product hasn’t been cooked, cured, smoked, rendered, or refined. Many small, custom-exempt (see below) processors also have a meat counter under the retail exemption.

  Retail-exempt wholesaling is limited to 25% of the dollar value of the processor’s total sales or $60,200 for red meat and meat products and $50,200 for poultry products per calendar year, whichever is less. Retail exempt processors cannot sell to other retail markets or to wholesalers or distributors. Retail exempt processors are subject to periodic, risk-based inspection by USDA FSIS and/or state authorities.

- **Stationary custom-exempt slaughter/processing**
  A custom-exempt plant may only slaughter and process livestock for the exclusive use of the owner(s) of the livestock or poultry. Like retail exempt plants, these facilities are subject to periodic, risk-based inspection by USDA FSIS and routinely inspected by state authorities.

  Livestock sold “on the hoof” to individual buyers, for their own household use, can be slaughtered and processed at custom-exempt facilities (see below). “Voluntary” species like bison may be processed here and sold retail, wholesale, and interstate.

- **Poultry exemptions**
  Federal law contains seven exemptions to the requirement that all poultry be inspected to be sold, explained here: [http://www.extension.org/pages/Understanding_Poultry_Exemptions](http://www.extension.org/pages/Understanding_Poultry_Exemptions)

  States treat these exemptions differently. In Oregon, small-scale producers have a few processing options. Under all of these options, poultry must be sold only within Oregon.

  A poultry producer may process up to 20,000 birds per year, that he raises himself, in a state-licensed facility that meets state sanitation requirements (see separate handout on ODA requirements for poultry/rabbit processing establishments);

  If this producer operates under the Small Enterprise Exemption (slaughter and cut-up only; also limited to 20,000 birds per year), he may purchase live birds raised by other producers, process them, and sell those birds back to the producers, who can then act as distributors.

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2 See 9 CFR 303.1(d)(2)(i)(a), (b), (d), or (e).

3 These dollar amounts are for 2010; any adjustments for 2011 will likely be published in summer 2011.
Federal and Oregon law allow multiple producers to use the same mobile poultry processing unit to each process up to 20,000 birds of their own raising, on their own farms. The unit must meet state sanitation requirements, but with some variation because it is mobile.

A new (2011) state law, HB2872, mirrors the federal 1000 bird exemption and will allow a producer to process and sell up to 1000 poultry per year direct to end consumers, without being a state-licensed processor. The final rules (e.g. site requirements/sale location options) are explained here: [http://www.oregon.gov/ODA/FSD/faq_2872.shtml](http://www.oregon.gov/ODA/FSD/faq_2872.shtml).

**“ON THE HOOF” LIVE SALES**

Rather than sell meat cuts, some livestock producers sell live animals, “on the hoof,” which the customers, as the new owners, can then have processed at a “custom-exempt,” state-licensed facility. Producers can sell a whole animal or shares: for example, a farmer sells one live steer to four people, each of whom gets a one-fourth share of the meat from that steer.

A “custom-exempt” plant may slaughter and process livestock only for the exclusive use of the owner(s). Some custom-exempt processors also have a mobile slaughter truck for on-farm slaughter, and some mobile slaughter trucks operate independently and bring carcasses to a custom-exempt processor. Unless a mobile slaughter unit is USDA-inspected (as of this writing, there are no inspected MSUs in Oregon), it cannot be used to slaughter and transport to a USDA processing facility.

Federal and state rules for on-hoof sales are explained in, “Frequently asked questions about using custom-exempt slaughter and processing facilities in Oregon for beef, pork, lamb, and goat”: [http://smallfarms.oregonstate.edu/sites/default/files/publications/techreports/TRFAQsmeat.pdf](http://smallfarms.oregonstate.edu/sites/default/files/publications/techreports/TRFAQsmeat.pdf)

**BUILDING AND SANITATION REQUIREMENTS FOR PROCESSING FACILITIES IN OREGON**

In Oregon, livestock slaughter and processing facilities must be constructed with impermeable and easily cleanable floors and walls, floors sloped to drains, tight-fitting doors and windows, and other construction requirements generally mandated for the food processing industry.

All processing facilities – small or large – must comply with the Oregon Administrative Rules (OAR) about construction, sanitation, and maintenance of such facilities.

The main rules you’ll need to follow are found in OAR Chapter 603 (Department of Agriculture), in two divisions: Division 25, “Food Establishment Standards and Standards for Retail Food Service Activities,” and Division 28, “Meat Products and Establishments.”

All the rules below start with “603” for the chapter; those with “025” in the middle are from Division 25, and those with “028” are from Division 28. Each division begins with definitions; specific rules are in numerical order.

Division 25, “Food Establishment Standards and Standards for Retail Food Service Activities”: [http://www.sos.state.or.us/archives/rules/OARS_600/OAR_603/603_025.html](http://www.sos.state.or.us/archives/rules/OARS_600/OAR_603/603_025.html)
OAR 603-028-0100, “Sanitation, Maintenance, and Construction,” requires that all meat establishments comply with:

- OAR 603-025-0020, “General Standards of Food Establishment Construction and Maintenance”;  
- OAR 603-025-0030, “Retail Food Code”; and  
- OAR 603-25-0150, “Food Processing Establishments.”

Additionally, all rabbit and poultry slaughter facilities must comply with:

- OAR 603-028-0605, “Sanitation, Maintenance, and Construction by Licensees”; and  
- OAR 603-028-0825, “Construction and Equipment.”

See ODA’s “Information for construction and operation of a rabbit/poultry slaughtering and processing establishment” for guidance (separate handout).

The definition of “Mobile Slaughter” can be found in OAR 603-028-0600. Mobile units must follow the construction requirements in 603-028-0605.

The state statutes behind the rules can be found in Oregon Revised Statutes, Chapter 603, “Meat Dealers and Slaughterers”: http://www.leg.state.or.us/ors/603.html.

State license requirements to process and/or sell meat and poultry products are explained here: http://www.oregon.gov/ODA/FSD/program_food.shtml#Meat

OREGON MEAT AND POULTRY PROCESSOR LISTINGS

On this page: http://www.extension.org/pages/Oregon_Facilities you will find (1) a list of all USDA-inspected slaughter facilities in Oregon and (2) instructions for using the Oregon Department of Agriculture license database to find processors.

REVISED MARCH 14, 2012
Frequently asked questions about using custom-exempt slaughter and processing facilities in Oregon for beef, pork, lamb, and goat

Lauren Gwin and Jim Postlewait
Authors

Lauren Gwin
Research Associate
lauren.gwin@oregonstate.edu
Agricultural and Resource Economics
Oregon State University
Niche Meat Processor Assistance Network

Jim Postlewait
Food Safety Division
Oregon Department of Agriculture

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Introduction

If livestock producers in Oregon wish to sell meat, they must have their livestock slaughtered and processed at a USDA-inspected facility. Some producers have chosen to sell live animals, which the customers, as the new owners, can then have processed at a “custom-exempt,” state-licensed facility. For example, Farmer Smith sells one live steer to four people, each of whom gets a one-fourth share of the meat from that steer.

This brochure explains, to both farmers and customers, the federal and state rules relevant to this practice. The frequently-asked-question format was chosen to give straightforward and accurate answers to the most common questions.

What does “custom-exempt” mean for slaughter or processing?

A “custom-exempt” plant, exempt from continuous inspection, can only slaughter and process livestock for the exclusive use of the owner(s), the owner’s family, and non-paying guests. Packages of custom processed meat and poultry must be labeled “NOT FOR SALE” (and cannot be labeled with “grass-fed” or other claims). This label is required because by law, the meat cannot be sold, traded, bartered, or given away, to a food bank or similar charity, for example. Custom operations are typically thought to process game meat for hunters, but they usually offer processing services to anyone who wants an animal slaughtered or processed for personal use.

Slaughter and processing businesses that operate under this exemption are inspected by both ODA and USDA on a regular basis, typically once or twice annually. Custom exempt slaughter and processing (also called “cut and wrap”) plants are expected to meet the same requirements for sanitation and construction that USDA-inspected plants must meet.

What are the relevant state and federal laws?

Custom-exempt slaughter and processing establishments are described in Oregon’s Revised Statutes in Chapters 603 and 619:

http://www.leg.state.or.us/ors/603.html
http://www.leg.state.or.us/ors/619.html

Buildings, controls, construction, packaging, sanitation, labeling, and other requirements for both types of business are described in Oregon’s Administrative Rules: Chapter 603, Divisions 13, 25, and 28:

http://arcweb.sos.state.or.us/rules/OARS_600/OAR_603/603_013.html
http://arcweb.sos.state.or.us/rules/OARS_600/OAR_603/603_025.html
http://arcweb.sos.state.or.us/rules/OARS_600/OAR_603/603_028.html

The Federal Meat Inspection Act gives USDA’s Food Safety Inspection Service (FSIS) jurisdiction over meat and poultry slaughter and processing. Federally inspected products can be shipped over state lines and internationally to many countries. Federal inspection requires a Hazard Analysis and Critical Control Point (HACCP) plan, Sanitary Standard Operating Procedures (SSOP), daily inspection of processing facilities, and, if the plant slaughters livestock, ante-mortem and post-mortem inspection of every animal.


The 27 state-level meat and poultry inspection programs operate at the discretion of and are regularly reviewed by FSIS. Oregon does not have such a program.
Can I sell 1/8th or even 1/16th of an animal, or only 1/2?

USDA does not have a specific rule about how many shares you may sell in any one animal. Some states restrict shares to four or eight per animal, but Oregon does not have such a restriction. The carcass must be labeled, by the fixed or mobile slaughter facility, with each owner’s name.

However, if you sell more than four shares per animal, you and your processor are very likely to come under additional scrutiny from both USDA and ODA. This is because it will appear that you are crossing the line and selling uninspected meat, rather than live animals, in violation of the Federal Meat Inspection Act. Remember: meat processed at a custom-exempt facility cannot be sold, only returned to the owner. The custom-exemption was originally designed for livestock producers to get their own livestock processed for their own home use. Stretching the exemption too far may cause it to be revoked.

In addition, keep in mind that the more shares you sell in each animal, the more work you are creating for your processor, who must speak with each share owner about scheduling, cutting orders, pick-up, and payment. The processor will earn the same revenue on one animal whether it is sold to two, four, or eight people.

Can I charge by the pound?

You are legally selling the animal when live; by the letter of the law, you should charge by live weight. However, it is generally recognized that this is often not practical, so you may charge by hanging weight (the weight taken after slaughter with hide, organs, head, and feet removed). You may not charge by final product weight (cut and wrapped).

For example, you sell a steer in four shares to four people. The whole carcass is 680 lbs hanging weight. One-fourth of that = 170 lbs. Your price per pound is $3. Each person pays you $3 * 170 = $510.

Can I advertise my beef shares when I’m selling other legal/licensed items such as eggs and vegetables at the farmers’ market, or on my web site?

Yes. However, you must be careful about the language you use in your advertising. “Beef shares available, $X/lb” is acceptable, but “250 lbs of beef for sale, $X/lb” is not. These may seem quite similar, but to regulatory authorities they are not. The first is advertising shares of a beef animal. The second is advertising meat. Because you are not using a USDA-inspected processing facility, you cannot sell meat, only the animal.

Can I get the animal slaughtered before I sell all the shares?

No. You must sell all the shares in the animal prior to slaughter. You are selling a live animal. If you sell a share after the animal is slaughtered, then you will be selling meat, which is not allowed if you are using a custom-exempt facility.
Once I sell an animal, does the new owner have to take it to the slaughter facility?
No. If you are using a fixed slaughter facility, you may transport the animal there. If you are using a mobile slaughter service, that person can slaughter the animal on your farm and then deliver it to the cut and wrap facility. Alternatively, the new owner can transport the animal to the slaughter facility.

How do I document that the carcass was sold while the animal was still alive?
You must provide the name of each buyer/owner to the slaughterer and cut and wrap facility. The slaughterer will label the carcass with the name(s). All parts of the carcass and its by-products must be identified with the owners’ names at all times. When ODA inspects a custom-exempt facility, they will look for these names. You do not need to provide separate certificates of ownership, though it is always a good idea to keep receipts for these transactions.

Who places the cutting order with the cut and wrap facility?
The share owners should call the cut and wrap facility directly to arrange cutting instructions (e.g. thickness of steaks, size of ground/stew meat packages, certain cut choices) as well as specify which carcass parts (e.g. liver, dog bones, heart, tongue) they want returned to them. When a group of individuals “cowpools” to purchase one animal together, and all individuals agree on cutting instructions, only one of them needs to call the processor to give these instructions. After the sale of the animal, there is no reason for the processor to contact the previous owner.

Can my customers pay me for processing?
No. Your customers pay you for shares of live animals. As the new owners of the animal, they must pay the processor directly for the service of slaughter and processing. Typically, they will do this when they pick up their meat from the processor.

Can I deliver frozen meat to my customers or do they have to pick up at the processing plant?
You may provide delivery as a free service to your customers. You may not charge a fee for delivery. And remember, you cannot be involved with payment for processing. That is a transaction between the customer and the processor. Your county may have additional regulations about transporting meat; check with your county health department.

Can I sell a share of a beef for a nominal charge such as $25 and then charge a price per pound of meat on top of that?
No. You can only charge a price per pound based on hanging weight.

Can two customers share a beef quarter together, with one having steaks and roasts, and the other taking the ground beef and economy cuts?
Yes. As the two owners of the meat, they can share it with each other however they like.
Can I make my own bacon and sausage and sell that?
No. You may only sell bacon and sausage if you start with USDA-inspected meat and do the processing at a USDA-inspected facility.

Can I render beef tallow for candle-making and sell that?
Yes. ODA does not regulate the use of animal by-products or the production of candles, so there is no problem with using custom beef tallow for candle production. Several people use goat milk from unlicensed dairies for the manufacturing of soap.

How can I sell meat at a farmers’ market, restaurant, or retail store in Oregon?
The meat must be processed at a USDA-inspected facility. You must obtain a “prepackaged meat seller” license from ODA. You also need approval from ODA for the location where you store your unsold product and the way you transport your product. Your county may have additional regulations; check with your county health department.

How can I sell meat at a farmers’ market, restaurant, or retail store in another state or via internet?
USDA-inspected meat can cross state lines. Check with the individual states about licensing requirements to sell in those states. Oregon does not require an additional license for approved facilities exporting meat from Oregon to another state.

Other Useful Resources – Especially For Consumers

Beef and Pork Whole Animal Buying Guide
This consumer-oriented guide, created by Iowa State University’s Small Meat Processors Working Group, explains buying pork and beef as whole animals (or portions thereof) directly from local producers. Includes: common retail pork and beef cuts with color photos by primal; values and costs of buying direct; livestock and meat marketing terms; storage needed and shelf life recommendations; safe handling and cooking; beef aging; basics of inspection; and live weight v. hanging weight v. finished cut weight.
www.extension.iastate.edu/store/ItemDetail/aspx?ProductID=13056

Did the Locker Plant Steal Some of My Meat?
This classic, clear, and widely used article, by Duane Wulf, Ph.D., South Dakota State University, explains how to calculate how much meat to expect from a market animal, using a range of examples for beef, pork, and lamb, based on the animal’s degree of leanness and muscle, how closely the carcass is trimmed, and what cuts are ordered.
http://ars.sdstate.edu/MeatSci/May99-1.htm

Still have a question? Contact:
Lauren Gwin, Oregon State University/NMPAN: (541) 737 1569
Jim Postlewait, Oregon Department of Agriculture: (503) 986 4724
Livestock Risk Protection (LRP)
Livestock Risk Protection (LRP)-Fed Cattle and Feeder Cattle are designed to insure against declining market prices. Fed Cattle: beef producers may select from a variety of coverage levels and insurance periods that correspond with the time their market-weight cattle would normally be sold. Feeder Cattle: producers may select from a variety of coverage levels and insurance periods that match the time their feeder cattle would normally be marketed (ownership may be retained). Swine: pork producers may select from a variety of coverage levels and insurance periods that match the time their hogs would normally be marketed.

Eligible Livestock
LRP is available for fed cattle, feeder cattle and swine. For fed cattle and swine, LRP includes most market livestock. For feeder cattle, there is a broad range of qualifying weights and types of livestock.

Insured Feeder Cattle - The endorsement is specifically for steer, heifer, predominately Brahman, or predominately dairy feeder cattle that weigh less than 9.0 hundredweight. Coverage is for feeder cattle a producer has a share in and meets the covered type and weight specifications as provided within the SCE for feeder cattle.

Maximum number of feeder cattle that may be insured under any one SCE is 1,000 head, and during any crop year is 2,000 head. Feeder cattle prices refer to a price series created and reported by the Chicago Mercantile Exchange (CME). The length of each endorsement for feeder cattle ranges from 13 to 52 weeks.

Insured Fed Cattle - The endorsement is for fed cattle a producer expects to grade select or higher and with a yield grade of 1 to 3, and to market for slaughter at 10 to 14 cwt at the end of the insurance period.

Maximum number of fed cattle insured under any one SCE is 2,000 head, and in a crop year is 4,000 head. Fed cattle prices refer to a price series published by the Agricultural Marketing Service (AMS). The length of each endorsement for fed cattle ranges from 13 to 52 weeks.

Insured Swine - The endorsement is for swine weighing between 203 to 304 pounds on a live basis, the producer expects to have and to market (for slaughter) at the end of the insurance period.

Maximum number of swine insured under any one SCE is 10,000 head, and during any crop year is 32,000 head. Hog prices refer to a lean based price series published by the Agricultural Marketing Service (AMS) of the USDA. The length of each endorsement for swine ranges from 13 to 26 weeks.

Availability in RMA Spokane Region
Idaho, Oregon, Washington - All counties

How LRP Works
1) Once eligibility is established through an application process, producers purchase an SCE for a certain number of head, level of coverage and number of weeks. Applying for the basic policy does not incur any costs nor does it require a commitment to purchasing coverage in the future. But once enrollment is in place, coverage may be purchased quickly without delay.

2) Information required for a SCE includes the number and type of livestock insured, the coverage price and premium cost for the coverage and the end date of the SCE. Premium is paid upon signing the SCE. USDA provides a 13 percent subsidy.

3) If the Actual Ending Value at the end of the insurance period is less than the coverage chosen, a settlement (indemnity) check is issued.

4) Liability is not dependent upon the price for which a producer sells their livestock. Proof of ownership is required.

This fact sheet gives only a general overview of the crop insurance program and is not a complete policy. For further information and an evaluation of your risk management needs, contact a crop insurance agent.
**Application Process**

Applications for LRP are submitted through FCIC-approved insurance providers. Once the application is approved, the livestock insurance agent assigns a policy number. A producer activates coverage at any time by applying for an SCE. No insurance coverage is provided until the producer submits an SCE. Insurance will attach immediately upon RMA confirmation of acceptance of the SCE.

There are funding limitations for all livestock programs; therefore, RMA tracks total policy sales against available underwriting capacity using a real-time web-based program. Applications for insurance will be rejected when the underwriting capacity has been reached.

**Cause of Loss**

A policy will be due an indemnity if fed cattle, feeder cattle and hog prices drop below a predetermined level and all terms and conditions of the policy have been met.

**Definitions**

**Actual Ending Value**  The Actual Ending Value is the weighted average price as defined in each SCE.

**Converting live weight to lean weight**  Multiply the live weight by the lean weight conversion factor of .74. E.g.: a 2.50 cwt. per head live weight is equal to 1.85 cwt. lean weight. The Target Weight should fall within the range of 1.50 and 2.25 cwt (this equates to a head weighing from about 203 to 304 lbs. on a live basis).

**Crop Year**  The twelve month period, beginning on July 1 and ending the following June 30 and is designated by the calendar year in which the period ends.

**Predominately Brahman**  Feeder cattle that are characterized by buyers as Brahman when sold or marketed.

**Predominately Dairy**  Feeder cattle that are characterized by buyers as a dairy breed when sold or marketed.

**Specific Coverage Endorsement**  An endorsement to the policy necessary to provide coverage that includes information about the class to be insured.

**Target Weight**  The anticipated weight at the ending period as specified in each SCE.

**RMA Web site Information**


**Where to Purchase**

All MPCI policies are available from private insurance agents. A list of livestock insurance agents is available at all USDA Service Centers or at the RMA website: [http://www3.rma.usda.gov/tools/agents/](http://www3.rma.usda.gov/tools/agents/)

**Regional Contact for RMA**

USDA/Risk Management Agency
Spokane Regional Office
11707 E Sprague Ave #201 - Spokane Valley, WA 99206 - Telephone 509 228-6320 - Fax 509 228-6321
E-Mail: rsowa@rma.usda.gov

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USDA’s Risk Management Agency (RMA) Farm and Foreign AG Services is continuing its efforts of creating more awareness throughout the agricultural community about managing risks on the farm.

RMA Mission
Provide and support a cost effective means of managing risk for Agriculture producers in order to improve the economic stability of agriculture.

Multi-Peril Crop Insurance (MPCI)
Federally subsidized and insures against many weather-related losses on 130 + crops, nationally. Choose from 50-75 percent (85 percent in some areas) of yield, and 55-100 percent of price. For Catastrophic Risk Protection (CAT), a producer must pay $300 for each eligible crop insurance contract in each county. For coverage at levels in excess of CAT, the administrative fee is $30 per crop per county. Administrative fees for CAT and additional levels can be waived for Limited Resource Farmers.

COMBO Products
The Common Crop Insurance Policy Basic Provisions provide both yield and revenue protection policies for barley, malting barley, canola/rapeseed, corn and wheat. Key features include:

- Revenue Protection Plan: provides protection against production loss, price decline or increase or a combination of both.
- Yield Protection Plan: provides protection against production loss for which revenue protection is available but is not elected.

Sales Closing Dates: vary depending on crop.

Adjusted Gross Revenue (AGR) Pilot
Provides an insurance safety net for producers growing insurable and non-insurable crops. AGR: 1) provides insurance coverage for multiple agricultural commodities in one insurance product; 2) uses a producer's historic Schedule F tax information as a base to provide a level of guaranteed revenue for the insurance period; 3) uses commodity production-cash receipts as the method of measurement; 4) reinforces program creditability using IRS tax forms; and 5) provides protection against low revenue due to unavoidable causes. Limited availability in Oregon: Benton, Clackamas, Columbia, Lane, Linn, Malheur, Marion, Multnomah, Polk, Washington and Yamhill counties. Sales Closing: 1/31.

Adjusted Gross Revenue-Lite (AGR-Lite)
Similar to AGR Pilot, the plan provides protection against low revenue due to unavoidable natural disasters and market fluctuations that affect income during the insurance year. Most farm-raised crops, animals, and animal products are eligible for protection. AGR-Lite also establishes revenue as a common denominator for the insurance of all agricultural commodities. The maximum liability of coverage is $1 million. Available in all Oregon

This fact sheet gives only a general overview of the crop insurance program and is not a complete policy. For further information and an evaluation of your risk management needs, contact a crop insurance agent.

**Livestock Risk Protection (LRP)**
LRP offers protection against a decline in fed cattle, feeder cattle, swine and lamb prices during the term of the Specific Coverage Endorsement (SCE).

**Livestock Gross Margin—Dairy (LGM)**
LGM-Dairy offers protection against loss of gross margin (market value of milk minus feed costs) on milk produced from dairy cows.

**Non-Insured Crop Disaster Assistance Program (NAP)**
Production protection program for growers producing crops for which there is currently no insurance program available. For specific details, contact USDA Farm Service Agency.

**Key Dates (dates listed are standard dates without regard to holidays/weekends)**

**Oregon Sales Closing Dates**
- Fall Canola/Rapeseed & Fall Onions (Umatilla County Only) - 8/31
- Barley and Mint (w/winter coverage), Forage (Alfalfa) Seed, Forage Production and Wheat - 9/30
- Apiiculture, Pasture-Rangeland-Forage - 9/30
- Apples, Blueberries, Cherries, Cranberries, Grapes, Pears & Stonefruit -11/20
- Cabbage and Spring Onions - 2/1
- all Other Spring Crops - 3/15
- AGR Pilot and AGR-Lite current policy holders - 1/31
- AGR-Lite 3/15 new applications

**Nursery, Livestock Gross Margin—Dairy & Livestock Risk Protection** – Please contact your crop/livestock insurance agent.

Producers wishing to make changes in their choice of policy options must notify their insurance provider by the sales closing date (including CAT insureds who wish to buy higher levels). Producers not insured during the previous year who desire to be insured for the coming year must sign an application.

**Insurance Effective Date** At time of planting for annual crops or November 21 for perennial crops, UNLESS acreage is not timely reported. Can vary by crop, type, and variety being grown. **Cancellation date** ALL policies (including CATASTROPHIC [CAT] level coverage) automatically renew each crop year unless insureds cancel their insurance by the date shown in the crop provisions.

**Oregon Reporting of Acreage and Crop Damage**
Each crop year the producer is required to submit an acreage report by unit for each insured crop. The acreage report must be signed and submitted by the producer on or before the acreage reporting date contained in the Special Provisions for the county for the insured crop. In the event of crop damage, producers should immediately notify their insurance provider of the damage.

**Oregon Production Reporting Dates**
Earlier of Acreage Reporting Date or 45 days after cancellation date for annual crops; ARD for all perennial crops. All insureds must have reported or updated their APH to the insurance provider. If reports are not received timely, yields will be assigned which may result in lower approved yields. For certain crops, late reporting may void insurability.

**Where to Purchase**
All MPCI, including CAT coverage insurance policies, are available from private insurance agents. A list of crop insurance agents is available at all USDA Service Centers or at the RMA website: [http://www3.rma.usda.gov/tools/agents/](http://www3.rma.usda.gov/tools/agents/)

**USDA/Risk Management Agency/Spokane Regional Office** - 11707 E Sprague # 201
**Spokane Valley, WA 99206**
**Telephone 509 228-6320  Fax 509 228-6321**

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