

SO YOU WANT TO PROCESS MEAT?

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EXECUTIVE SUMMARY

Most of the livestock raised in Oregon is not slaughtered and processed in-state. It is estimated that less than 5% of the cattle produced in Oregon are actually slaughtered here under USDA inspection. Market conditions mean that producers are receiving less for their livestock even as the cost of raising animals continues to escalate. The sky-rocketing cost of fuel makes transporting animals out of state for slaughter a significant financial burden on the producer. It is no wonder that ranchers are looking for alternatives.

As consumers become more conscious of where their food comes from and what it takes to produce it, new opportunities arise for the entrepreneur. In addition to the traditional attributes like freshness and taste, the consumer's purchasing behavior is also driven by personal values like animal rights, a healthy environment and the desire to support local agriculture. Ranchers are interested in learning what it takes to become a "price maker" instead of struggling in their traditional role as a "price taker".

However, competition in the meat industry is intense and anyone interested in becoming a meat processor or meat purveyor must clearly assess the alternatives. As meat processing companies continue to consolidate, smaller, less efficient plants will be put out of business. Today, Oregon's meat processing industry is under-capitalized given the size of its beef industry. The lack of adequate rendering capacity represents another challenge. There are precious few USDA inspected slaughter facilities with the capacity to process livestock. And, a State Meat Inspection Program does not offer an immediate solution.

Some producers are considering a USDA inspected mobile slaughter unit as a remedy based on the popularity of this concept in neighboring states. But operating a mobile unit is a breakeven proposition and few are willing to operate such a unit if it won't pencil out financially. Moreover, a mobile unit must operate in conjunction with a stationary fabrication facility. The cost of establishing even a small plant can exceed \$1.5 million and the potential return on investment is small.

There is no simple solution to the lack of adequate meat processing facilities in Oregon. Yet, there are new opportunities to provide consumers with more choices. Many consumers want tasty, safe, healthy, local meat products that are not produced by traditional means. Oregon is a hot bed in this revolution. But satisfying this desire comes at a price. Nevertheless, by targeting the right market segment with the right product, even small scale meat processors can be profitable.

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MEAT PROCESSING IN OREGON

Introduction

Oregon's livestock industry is a major contributor to Oregon's agriculture economy. In 2007, the livestock industry accounted for \$1.1 billion of Oregon's \$5 billion farm economy. More than one-third of Oregon's 40,000 farms and ranches raise livestock. However, in recent years the number of farms and ranches producing livestock have declined owing to decreasing revenues and increasing costs. A number of issues continue to plague the industry: changing consumer preferences, lack of processing capacity, lack of in-state rendering capacity, food safety concerns, high transportation costs, and fierce competition.

It is an unfortunate fact that many of the animals raised in Oregon are not processed in-state. This means Oregon's ranchers must pay to transport their animals to market reducing their net income. Out-of-state processors add-value to the meat and return it to Oregon and neighboring states for sale to retail customers and the institutional trade. By some estimates less than 5% of the animals sold for slaughter by Oregon's livestock producers are actually processed in Oregon.

By all accounts, Oregon's meat processing capacity is limited in terms of its ability to process all that Oregon's ranchers produce. It is a difficult time to be a "price taker". On the other hand, there is a growing demand for local meat products fueled by consumers looking for "sustainable", "natural" meat items. There seems to be an opportunity for forward thinking, local entrepreneurs who want to develop a capacity to take advantage of this new niche market. However, while this opportunity is appealing to some, there are a number of challenges associated with the concept. This report attempts to pull together some of the information that is already available into one document that will provide the reader with relevant information about the opportunities and challenges associated with small scale meat processing in Oregon. This paper will focus on beef processing but lamb, swine and poultry processing are in a similar situation.

Oregon's Livestock Industry

Oregon has a significant livestock industry. More than 76% of the cattle are located in the central and eastern part of the state. Oregon's beef industry consists of roughly 1.75 million head, and the dairy industry consists of about 116,000 head. Both of these populations are declining. There are more than 200,000 head of sheep in the state. Oregon's hog population is small in comparison to the major hog producing states. Meat goats are increasingly

prevalent. The table below provides a snap shot of Oregon's livestock inventory by county.

Oregon's Livestock Inventory by County (Jan. 2008)

REGION	CATTLE & CALVES	DAIRY COWS	SHEEP & LAMBS	HOGS (SOWS)	MEAT GOATS
County	head	head	head	head	head
Benton	7,300	2,300	5,200	500	0
Clackamas	37,000	1,500	7,700	1,000	800
Clatsop	9,900	2,000	500	200	0
Columbia	9,000	0	0	300	0
Lane	34,000	2,400	11,000	500	0
Lincoln	6,000	0	3,000	0	0
Linn	28,400	6,100	33,800	500	0
Marion	58,900	17,000	8,700	1,400	1,000
Multnomah	6,600	0	1,100	200	100
Polk	23,600	6,100	8,300	200	500
Tillamook	40,000	27,500	0	0	0
Washington	16,300	3,400	1,900	700	500
Yamhill	25,900	5,000	7,700	1,000	500
Not disclosed	0	470	1,400	100	0
NORTHWEST	302,900	73,770	90,300	6,600	3,400
Coos	21,200	3,250	11,200	100	0
Curry	7,000	0	16,900	100	0
Douglas	53,600	0	29,400	600	7,080
Jackson	20,200	300	4,100	800	0
Josephine	5,800	1,500	700	700	0
SOUTHWEST	107,800	5,050	62,300	2,300	7,080
Gilliam	16,000	0	0	0	0
Hood River	0	0	0	0	0
Morrow	105,000	0	0	100	0
Sherman	2,500	0	0	0	0
Wasco	20,000	0	0	0	0
Wheeler	30,000	0	0	0	0
NORTH CENTRAL	173,500	0	0	100	0
Crook	72,400	0	1,200	200	0
Deschutes	27,900	0	1,800	1,000	0
Jefferson	40,400	0	4,100	200	0
Klamath	210,500	4,900	6,100	500	0
Lake	97,500	0	1,200	200	0

Not disclosed	0	160	0	0	0
SOUTH CENTRAL	448,700	5,060	14,400	2,100	0
Baker	124,000	0	3,000	0	0
Grant	55,600	0	500	100	0
Harney	130,900	0	8,900	100	0
Malheur	251,500	4,200	12,800	200	3,000
Union	43,000	0	1,700	0	0
Umatilla	79,300	27,800	12,400	800	4,200
Wallowa	30,600	0	1,500	100	0
Not disclosed	0	290	10,600	2,900	0
EASTERN	714,900	32,290	51,400	4,200	7,200
TOTAL	1,747,800	116,170	218,400	15,300	17,680

Source: Oregon State University – Oregon Agricultural Information Network (OAIN)

Producers are currently faced with declining prices as the cost of producing livestock increases. Of course, this is a general statement and this varies between species. The table below gives the average price paid to ranchers for beef cattle (live weight) over the past three years. Historically cyclical, prices are once again on the decline as consumption decreases.

Live Steer Prices (2006-2008)

YEAR	QTR	Steer Price
		\$ / cwt
2006	I.	90.29
2006	II.	81.16
2006	III.	85.48
2006	IV.	87.44
2007	I.	91.09
2007	II.	94.48
2007	III.	92.34
2007	IV.	93.01
2008	I.	91.05
2008	II.	92.90
2008	III.	98.72
2008	IV.	89.29

Source: USDA Economic Research Service

A few entrepreneurial ranchers are seeking alternatives to simply selling their livestock into traditional channels. Ranchers are turning to direct marketing

options such as forming buying groups, selling at farmer's markets, and selling to retailers and local restaurants. However, taking this approach assumes the producer can get their livestock slaughtered and processed to their customer's satisfaction and at a price that allows them to be competitive.

Oregon's Meat Processors

There are several different kinds of meat processors. As of December 2007, there were 12 USDA slaughterhouses, 50 USDA inspected meat processors, 12 custom slaughterhouses, 86 custom meat processors, 55 mobile slaughter trucks and 1,405 firms with a meat seller license. This latter group consists mainly of grocery stores.

USDA Inspected Slaughter Facilities

This is the current list of USDA inspected slaughter facilities in Oregon.

1. B&D Meat Company – Roseburg
2. Carlton Packing – Carlton
3. Central Oregon Butcher Boy Meats – Prineville
4. Crater Meat Packing Co. – Medford
5. Dayton Meat Co. – Dayton
6. Emmert's Buxton Meat Co. – Sandy
7. Marks Meat – Canby
8. Mohawk Meat Co. – Springfield
9. Mt. Angel Meat – Mt. Angel
10. Oregon Beef – Madras
11. Bartel's Meat Packing – Eugene
12. Masami Foods – Klamath Falls

Note: Oregon State University's Clark Meat Center in Corvallis is also inspected by the USDA but it only handles "in-house" products.

USDA assigns an inspector to each plant. The inspector is required to be present whenever a plant slaughters a meat animal¹. All slaughter operations are carried

¹ Meat animals are defined by USDA and include cattle, hogs, sheep, goats, emu, chickens and turkeys. This definition does not include rabbits, buffalo, deer, elk, ducks, quail or pheasants. These are referred to as "non-amenable" species. Non-amenable, state inspected meat products are allowed to move in interstate commerce. If USDA has defined slaughter procedures for a non-amenable species, then that animal may be slaughtered under USDA inspection if the plant makes a request. The plant is required to cover USDA inspection costs for all non-amenable species.

out in compliance with the Humane Methods of Slaughter Act of 1978. All products are processed under the Federal Meat Inspection Act (FMIA) or the Poultry Products Inspection Act (PPIA). For those plants operating under USDA inspection, USDA covers all costs of the inspection services, except overtime. The plant pays overtime costs. Plants must also provide an office, telephone and laundry services for the USDA inspectors.

The Oregon Department of Agriculture (ODA) also has statutory responsibility to license and inspect meat establishments. The ODA is required by state law (ORS 603 and ORS 619) to license all facilities that sell or process meat. ODA inspects for sanitation, food handling, personnel practices, labeling, etc. This includes custom establishments and establishments that are USDA inspected. However, ODA performs minimal inspection of firms that are under continuous USDA inspection. ODA's inspection would normally be on an annual basis only to assure USDA covers all operations of the plant. If it is determined that some activities occur that are not covered by USDA, then ODA will inspect those activities based on the amount of activity, the risk, and past history.

Livestock producers who are interested in selling their meat to the public must slaughter and process their meat in a USDA inspected facility. Some of these processing businesses are also involved in selling the products they process to end-users and are actively seeking customers as well as processing meat for producers. Others slaughter animals, cut and wrap the meat according to a customer's specifications and return it to the producer. In this case, the producer is responsible for promoting and selling his or her meat.

As mentioned, it's estimated that the USDA inspected slaughter plants in Oregon handle less than 5% of the beef cattle sold for slaughter that are raised in Oregon. And, it's possible, indeed likely, that some of the meat processed by these plants comes from out-of-state. The number of animals processed and the type of animal processed vary from one company to another. Some only process hogs, some process a few head of beef while focusing on sheep. There were approximately 35,000 head of beef slaughtered in Oregon in 2008 under USDA inspection. By comparison, Tyson Foods' eleven mid-western plants have the capacity to process 38,000 beef cattle per day.

USDA Inspected Meat Processors

In addition to the Oregon's 12 USDA inspected slaughter facilities, there are 50 USDA inspected meat processing operations that handle a significant amount of meat, but do not slaughter animals. Additional processing of meat by these firms may include breaking a carcass into primal cuts, making jerky, making sausage, making hamburger, producing frozen entrees, making soup, or any other types of processing where the final product contains more than 3% meat.

USDA provides daily, but not necessarily full time inspection, to plants that process meat shipped to them in boxes or as hanging carcasses. Since the meat processed by these firms is consumed by the public, it must come only from animals that were slaughtered under USDA inspection. Here is a partial list of some of the companies that make up this tier of meat processors.

1. Bruce Packing – Silverton
2. Firehouse Meats – The Dalles
3. Gartner’s Meats – Portland
4. Hill Meat Co. - Pendleton
5. Interstate Meat Distributors – Clackamas
6. Nicky USA – Portland
7. Strawberry Mountain Meat – John Day
8. Truitt Bros. - Salem

These processors serve local, regional and even national markets. Members of this group may deal directly with retail customers, distributors, and/or institutional end-users. They are more likely to allocate resources to promoting their products and may have advertising budgets. For some of the firms, meat is viewed as an ingredient. These firms may or may not use meat from animals raised in Oregon. Some of these meat processors import meat from low cost producers as a way of remaining price competitive. Meat processing at this level is global in scale.

Custom Processors

In addition, there are more than 150 custom meat processors and mobile meat processing operations in Oregon. These businesses process wild game and livestock for individual clients. USDA inspection is not required for custom operators who slaughter or process meat and poultry for the owner of the product. Such product is for the owner’s use only and cannot be re-sold to the public. Nevertheless, the processing facility is required to be maintained and operated in a sanitary manner and to mark the product “Not for Sale” under the FMIA or “Exempted – P.L. 90-492.” USDA reviews custom exempt plants annually for compliance with these requirements, or more often depending upon the findings. The ODA performs inspections on all these type of meat operations (i.e.: meat markets, custom establishments, and mobile slaughter trucks) from 1 to 4 times a year. The frequency is determined by the inspector and is based on the amount of activity, the risk and the past history of the firm.



This is an example of a custom mobile slaughtering truck. (Photo: Don Pierce)

State Meat Inspection Program (SMIP)

The Federal Government allows for the implementation of a state-federal meat inspection program for products sold to the public in the state in which they are slaughtered and processed. However, the new Farm Bill anticipates that even state inspected meat products may be sold inter-state. The 1967 Federal Meat Inspection Act and the 1968 Wholesome Poultry Products Act established a state-federal cooperative inspection program which requires state inspection programs to be "at least equal to" the federal program. The states run the programs, and the inspectors are employees of the state. But, all state programs are regularly audited by the USDA. Currently 27 states participate in this program that is funded jointly by states and the USDA Food Safety and Inspection Service (FSIS). Oregon used to have a state meat inspection program but canceled its cooperative agreements with USDA in the early 1970s due to a lack of demand for this service.

Oregon State University² conducted a survey in April/May 2008 to assess the level of interest in an Oregon State Meat Inspection Program. A total of 48

² Durham, Catherine, "Northwest Meat and Livestock Processor and Producer Survey on State Inspection Program", OSU Extension Publication SR 1089-E, February 2009.

livestock processors and 63 livestock producers responded to the survey. Overall, livestock processing facilities currently operating with USDA inspection did not foresee as many benefits to a state meat slaughter and processing inspection program as did custom exempt processing businesses.

Ron McKay, the former administrator of the ODA's Food Safety Division, completed a study in January 2008 that attempted to look at costs associated with re-establishing a state meat inspection program in Oregon. USDA will supply up to 60% of the funding. McKay estimated that the total cost of a program with 40 plants would be around \$1.2 million per year. However, North Dakota currently operates a program with 13 plants and 6 FTE's. North Dakota's portion of their program is approximately \$360,000 per year.

Advantages of SMIP

1. An SMIP allows producers to claim that their products are locally grown, and locally processed. This means that they can serve that segment of the public interested in purchasing locally produced and processed meat products.
2. Some producers will be able to reduce their transportation costs by working with a local custom meat processor who can sell to the public with state inspection. Most USDA inspected slaughter facilities are located in the Willamette Valley and along the I-5 corridor in the Western Oregon. Custom slaughterhouses and processing facilities are located across the state and could add state inspection to serve producers in remote locations.
3. Custom exempt facilities generally operate at lower volumes than USDA inspected facilities and may be able to grow their business benefiting from a state inspection program. Over half of the custom exempt processors surveyed by OSU predicted the addition of at least one full-time employee if their business was state inspected. Custom exempt processors often expressed a greater willingness to work with a state employee rather than a federal inspector.

Disadvantages of SMIP

1. The ODA would incur significant start-up and operating costs. Upfront costs would include: hiring new staff, purchasing computer equipment and participating in extensive USDA training programs. The ODA's policy is to charge user fees to cover program costs. In contrast, the USDA is obligated to provide inspection services at no cost although some costs are incurred by the processor.
2. Existing USDA inspected facilities may not support establishing a state meat inspection program because they are concerned that additional fees will increase the price of meat in the state.

3. According to meat processors, one of the main factors limiting potential increases in production is a lack of available skilled employees. This sector of the industry needs more trained workers.
4. There are a total of 12 custom stationary slaughter facilities that could benefit from a SMIP. Three are in central Oregon (Madrás, Parkdale, and The Dalles) and three others are located in eastern Oregon (Cove, Ontario, Vale). These facilities may not be conveniently located to meet the needs of some producers. And, establishing a SMIP will not create new plants in places that may need them.
5. The 55 existing mobile slaughter units (as pictured on page 10) are not suitable for USDA equivalency.

Summary SMIP

A state meat inspection program would allow smaller processors to service livestock producers who desire to take advantage of local sales opportunities. Yet, it is still unclear how large the local market for Oregon produced meat products actually is. Therefore, it is also unclear how many processors would actually be willing to support a state meat inspection program, especially if they have to make changes to their facilities to meet inspection requirements. Some *producers* see an opportunity while some existing *processors* are skeptical. Even a small program would cost several hundred thousand dollars per year. User fees could be substantial, particularly if only a few companies use the service. More than likely, anyone interested in investing several million dollars in a new slaughter facility would opt for USDA inspection. With only limited state resources available, it may be more cost effective to assist processors in obtaining USDA certification.

LACK OF RENDERING CAPACITY³

For many years, Oregon had two in-state rendering plants that handled and processed more than 40 thousand tons of animal mortality and meat processing byproducts derived from butchering beef, hogs, and game animals. The material must be safely processed into marketable products, or disposed of properly to protect public health.

Recent events have resulted in significant changes to the rendering business in Oregon. The discovery of *bovine spongiform encephalopathy* (BSE) has raised

³ Cascade Economics, LLC, "Animal Byproduct Technology Assessment and Market Analysis: Options for Oregon", September 2007. These are the conclusions and recommendations taken directly from the report.

concerns about possible disease transmission to humans and animals through the processed byproducts, resulting in a decrease in demand for those products. In addition, import sources have increased the supplies of products traditionally made by rendering firms, resulting in much lower prices. Combined with local environmental issues, these conditions have largely contributed to the closure in October, 2006 of the two Oregon rendering companies.

The closures have an effect on the cost structure of the livestock industry, which must pay more to utilize rendering services from California or Washington. Grocery stores and meat cutting establishments, horse owners and breeders, and livestock owners with on-farm mortalities are also significantly affected, as they face fewer options for animal waste disposal. Some landfills have received limited duration approval from the state to accept animal waste; however, this is not considered a viable long term solution.

Governor Kulongoski formed an Oregon Solutions Team in January 2007 to focus on exploring both short-term and potential long-term solutions to the animal byproducts processing and disposal problem. Team members sponsored a study to examine the practicality of composting, a review of other technologies for processing, and a preliminary examination of existing and future markets for animal byproducts. The report was issued in September 2007.

Major Findings and Conclusions

1. Loss of rendering plants has left fewer options available to many Oregon businesses that used them, and additional expense incurred.
 - a. Geographically, businesses engaged in ranching and dairying, hogs, or other livestock, and meat packers and butchers in Central and Southern Oregon are most directly affected.
 - b. Elsewhere, particularly in Northwest Oregon and Eastern Oregon, the effects are varied, depending upon whether or not the businesses already used other out-of-state services.
 - c. Many meat packers and wholesale processors, statewide, report increases of 33 to 50 percent in animal byproduct disposal costs during 2006.
 - d. The largest dairy cooperative in the state has, in the past, used in-state rendering. In recent years, the cooperative shifted to landfills for disposal of dairy mortalities, but continues to seek safe, effective, and lower cost options.
 - e. Rendering continues to be a major method of disposal in Oregon, but it is accomplished by transporting to out-of-state processing plants. For some, the out-of-state processors have always represented the best (least-cost) alternatives for disposal.

- f. Many generators of mortality and animal byproducts believe transporting wastes long distances to out-of-state renderers is not sustainable as fuel costs continue to rise.
 - g. The cost of rendering increased significantly after the Food and Drug Administration rule to require removing brains and spinal cord materials from ruminant animals over 30 months of age prior to rendering, as a means of limiting possible BSE transmission.
2. The study team estimates that about 91.65 million lbs. of animal byproducts are generated annually in Oregon, with about 81.98 million lbs. recoverable. A large share of the animal mortality is beef cattle (and to a lesser extent, other livestock); this includes range animals that are not retrieved and instead are left to natural processes.
 - a. More than half (55 percent) of recoverable byproducts is offal (processed meat byproduct), about a quarter (26 percent) is animal mortalities, and the remainder (19 percent) is grocery trim and scrap.
 - b. In terms of animal mortalities, nearly two-thirds (64.5 percent) are beef cattle and calves, with the remainder as dairy cows (16.7 percent), horses (14.4 percent), sheep (3.5 percent), and hogs (1.0 percent).

Estimated Recoverable Mortality and Byproducts Generated,
by Region of Oregon and Source Type (million lbs)

Region	Recoverable Animal Mortality	Offal	Grocery Trim and Scrap	Total Weight
Northwest	8.70	25.32	11.36	45.38
Southwest	3.00	0.54	1.54	5.08
North Central	1.91	4.70	0.33	6.94
South Central	2.52	14.09	1.60	18.21
Eastern	5.33	0.08	0.96	6.37
Total	21.46	44.73	15.79	81.98
Percent	26%	55%	19%	100%

3. The future supply of animal byproducts is expected to increase a total of four to seven percent, depending upon source and type, within the next five years. This is based on projections for each of the major animal species groups.
4. There is relatively little seasonal variability in mortality and meat byproduct processing volumes. This is an important and positive consideration for

establishing continuously operating processing technologies.

5. Landfill disposal of animal mortality and meat processing waste are currently allowed at some 13 landfills throughout Oregon. DEQ, the Oregon Solutions Team, and indeed most landfill operators, view landfill disposal of animal mortalities as only a short-term option.
 - a. Two large landfills (Columbia Ridge in Arlington and Coffin Butte near Corvallis) have several years remaining on their permits for accepting animal byproducts. The landfills represent the least cost disposal option for many who require animal byproduct disposal, depending on the distance to the landfill.
 - b. To the extent that landfills remain affordable and available to accept animal byproducts, they will continue to attract these materials. This option will hinder to some extent the development of new markets for potential products by effectively "bidding away" supplies of animal byproduct source material.
6. The study team considered seven generic types of processing options for animal byproducts: composting, anaerobic digestion, thermal gasification and pyrolysis, direct combustion (incineration), plasma arc, alkaline hydrolysis, and acid and enzymatic hydrolysis.
 - a. Each of the alternatives has been used to process some type of solid waste. A few of the processes have been used to process animal byproducts. Each of the alternative processes has the potential to yield a product.
 - b. Four of the seven processes met certain technical factors and characteristics to be considered for further analysis during the study. Among the factors were technological risk, health and safety, and feedstock versatility.
 - c. The four processes subjected to additional analysis were composting, anaerobic digestion, alkaline hydrolysis, and thermal gasification.
 - d. Screening criteria supplied by the Oregon Solutions Team were applied to the four processes selected for further analysis. Composting, anaerobic digestion, and thermal gasification were found to be "conditionally feasible," and alkaline hydrolysis was found to be "feasible."
7. A preliminary market analysis was conducted for each of the potential products that could be derived from processed animal byproducts. The potential products included compost, bio-fuels (ethanol and bio-diesel), bio-gas, bio-char, bio-oil, and hydrolyzate.

8. The technical analysis described above yielded four processes that were considered “conditionally feasible” or “feasible.” These processes yield products that were subjected to more detailed analysis of market potential. These products are discussed below.
- a. **Compost:** Oregon has a modest, but growing market for compost generated from organic materials. There is strong interest among farmers for generating compost from animal mortalities. However, there are significant barriers to composting of animal byproducts (ABP) and to the commercial use and public acceptance of compost derived from ABP:
 - i. It is uncertain whether composting processes will reduce pathogens to safe levels, particularly prions responsible for BSE. Safe design and operating conditions for ABP composting should be established.
 - ii. The market for compost in general is modest in size relative to potential supplies of organic materials, and animal-based sources of compost will not compete well in the near future.
 - iii. Composting of ABP has the potential to be a relatively low cost means of treating animal byproducts. However, the design and operating conditions of the facilities should reflect local conditions, including the characteristics of ABP, magnitude (size) of processing operation, and proximity of natural resources and humans to the operations.
 - b. **Gaseous Fuels (bio-gas or syngas):** Anaerobic digestion and thermal gasification can yield medium- and low-Btu fuel gas, respectively, from animal byproduct feedstocks. The fuel gas is often used in on-site electricity generation or cogeneration applications. The market for these alternative types of fuel gas is small but increasing, and its closest competitor is high-Btu natural gas.
 - i. Comparatively flat forecasts for natural gas prices in the medium-to-long term future argue against rapid technological advance or increases in supply and demand for fuel gases generated from waste materials. However, an expanding interest in this country to use energy from renewable sources, including government subsidies and tax credits, should improve the prospects for alternative fuel gas markets in the future.
 - c. **Hydrolyzate:** Alkaline hydrolysis will yield hydrolyzate by using animal byproducts as feedstock. There is evidence that the hydrolyzate can be used as fertilizer, and as a feedstock for biogas generation or biodiesel refinement. The market is in its infancy,

although development of processes to turn hydrolyzate into biofuels should increase commercial viability in the future.

MARKETS

“Know your customer” is a phrase that demands attention. The success of any business depends on this. Competition in the meat industry is intense and anyone interested in becoming a meat processor or meat purveyor must clearly define his or her target market. It is critical to estimate the demand for the products you plan to sell prior to investing in this industry. On a large scale, the meat industry consists of only a few powerful players. On a small scale, being able to differentiate your product to suit the needs of a specific, highly particular set of customers is essential.

According to a representative of United Western Grocers, there are two main beef suppliers to markets in Oregon. United Western Grocers ships both to retail and food service accounts. About 75% of the products come from Tyson Fresh Meats (formerly IBP). Another 24.5% comes from JBS/Swift (formerly ConAgra). About 95% of the meat is graded “select” (45% of that is black angus beef) and the rest is “choice”.

The table below serves to briefly describe six market channels. This table represents broad groups of players within the meat industry. The quantity of meat products any one firm handles is an important factor in determining which of these categories a firm may chose to participate in. Larger companies often deal in all six areas.

Grinders & Processors	Companies that fall in this category buy various mixes of beef trim from various classes of cattle; they predominantly make ground beef products such as hamburger patties and ground beef chubs. Processors are companies that take ground product and whole muscle cuts and add value by the following methods: slicing, cooking, portion control, curing, etc.
Distributors	Distributors are companies that traditionally buy from Grinders, Processors and in some cases, the Meat Packer. Some of their customers are retailers, wholesalers, restaurants and hospitals.
Retail	Retailers traditionally buy from Meat Packers, Grinders, Processors, and Distributors. This includes direct marketing groups.
HRI Customers	Hotel, Restaurant and Institutional (HRI) customers traditionally buy from Grinders, Processors and Distributors. On occasion, HRI will buy directly from a Meat Packer and/or producer marketing groups especially if the facility offers some unique products that they cannot traditionally get through standard

	distribution channels. Trading Companies often act as procurement arms for small HRI customer groups.
Exporters	Exporters are companies with foreign or domestic ownership who buy, usually in container lots or on a LTL basis, and consolidate products for shipments overseas. Many of the plant's offal or by-products will go to the international export market.
HALAL and KOSHER	The HALAL market is the Islamic market whereby the animal has a ritual slaughter. KOSHER foods have their niche. This market includes all classes from Grinder, Processors, Distributors and Retailers.

Consumer Purchasing Behavior

Meat processors may chose to concentrate on selling to others in the meat business like grinders, other meat processors, wholesalers, or even the institutional trade. However, many small producers/processors will necessarily focus on the retail consumer as does this report.

Fortunately, the University of Nevada at Reno completed a technical report in February 2007 funded by the USDA that shed a great deal of light on this subject.⁴ First, the Nevada study asked over 5,200 consumers in Nevada how often they eat meat, what types of meat they eat, and where they source their meat items. Fifty-one percent of respondents said their household consumes meat between 1-5 times per week. One-third of the households eat meat between 5-10 times each week. The most popular meat items seem to be tri-tip, beef roasts and ground beef. Fully 77% of the respondents said they obtain their meat from grocery stores, 6% from natural food stores, and 3% from specialty meat stores. Less than 1% of the consumers surveyed buy meat direct from ranchers or over the internet.

Second, the survey demonstrated that there are a number of factors that influence the consumer's purchasing behavior at the household level. The table below reflects many of these factors. The various traits have been ranked by level of importance.

This result clearly show, at least for the Nevada consumers responding to the survey, that freshness and taste are the two most important factors influencing the consumer's purchasing decision. Product safety is also a key factor influencing the consumer's decision whether or not to purchase meat and which

⁴ Curtis, Kynda, et al, "Locally Produced Livestock Processing and Marketing Feasibility Assessment", University of Nevada Technical Report UCED 2006/07-13, February 2007.

meat products to purchase. Branded, locally grown meat items were not as important to consumers in Nevada.

Consumer Preferences

Rank	Trait	Extremely Important	Very Important	Somewhat Important	Not very Important	Not Important
1	Freshness	85%	8%	2%	1%	1%
2	Flavor/taste	83%	11%	1%	1%	4%
3	Safety	76%	12%	5%	3%	4%
4	Tenderness	64%	24%	7%	2%	3%
5	Leanness	51%	29%	13%	4%	3%
6	Price	50%	28%	12%	7%	3%
7	Humanely	43%	21%	17%	9%	10%
8	Environment	33%	25%	23%	10%	9%
9	Marbling	26%	31%	29%	8%	6%
10	Natural	32%	23%	23%	13%	9%
11	Type feed	27%	28%	25%	9%	11%
12	Packaging	28%	27%	24%	10%	11%
13	Organic	31%	21%	25%	12%	11%
14	Texture	23%	31%	31%	7%	8%
15	Promotions	24%	24%	23%	14%	15%
16	Locally grown	19%	17%	30%	15%	19%
17	Branded	12%	17%	32%	17%	22%

Source: University of Nevada at Reno Study pp. 22-36

Freshness

Freshness of the meat refers to how old the meat appears at the time of sale. This has nothing to do with the aging of the meat prior to delivery to the store. Consumers are very interested in whether or not the meat appears fresh.

Flavor and Taste

The issue of taste is difficult to address from the standpoint of meat production because of the variety of production and genetic factors that impact it. The age, breed and sex of the animal are factors that are recognized to impact flavor of meat. Diet or feed source has been identified as the most important environmental factors determining meat flavor. How the animals are handled during processing is another key factor. Animals who are unaware that they are

about to be slaughtered are better tasting than those who are stressed during the process.

Product Safety

Food safety is an increasingly important issue for consumers brought about by E-coli contamination and reports of *Bovine Spongiform Encephalopathy* (BSE) disease in meat. Today's meat industry is generally recognized as one of the most highly regulated food industries in the USA. Yet, despite all the regulation, contaminated meat does reach the consumer. In 1993, an E.coli outbreak caused four hundred illnesses and four deaths in the Pacific Northwest. This resulted in the 1996 in the passage of the Pathogen Reduction/Hazard Analysis and Critical Control Point (HACCP) rules.

HACCP⁵

The Hazard Analysis Critical Control Point (HACCP) program is required by law to be implemented at all federally-inspected meat processing facilities. It becomes a means to self-govern a processing operation to assure that the product leaving the facility has been handled in a manner that will minimize food borne pathogens. A facility is required to develop a plan acceptable to USDA. It is the intent of HACCP that each plant establishes preventive measures which are based on sound scientific principles to ensure food safety.

HACCP is based on science that focuses on identification and prevention of hazards from contaminating food. Traditionally, industry and regulators have depended on spot-checks of manufacturing conditions and random sampling of final products to ensure food safety. This approach, however, tends to be reactive, rather than preventive. A good HACCP plan that is properly administered and kept up to date can be used as a tool to differentiate a firm from competitors. Safe food attracts customers. A careless process is sure to sicken and drive customers away.

A HACCP plan has seven principles:

1. Hazards analysis - Potential hazards associated with a food are identified and measures to control those hazards are developed. The hazard could be biological, such as a microbe, chemical, and/or toxins. Physical hazards such as ground glass or metal fragments must also be accounted for.
2. Identify critical control points - These are points in food production starting with the raw state and moving through processing, on to shipping, all the way to

⁵ NEWCO Northwest, LLC, "Oregon Lamb Processing Feasibility Study", August 2003

the consumer. Examples of these production points are slaughtering, cooling, packaging, and metal detection.

3. Establish preventive measures with critical limits for each control point. For a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any harmful microbes.
4. Establish procedures to monitor the critical control points. Such procedures might include determining how and by whom cooking time and temperature should be monitored.
5. Establish corrective actions to be taken when monitoring shows that a critical limit has not been met. For example, reprocessing or disposing of food if the minimum cooking temperature is not met.
6. Establish procedures to verify that the system is working properly. For example, testing time-and-temperature recording devices to verify that a cooking unit is working properly.
7. Establish effective record keeping to document the HACCP system. This would include records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems.

Each of these principles must be backed by sound scientific knowledge. For example, published microbiological studies on time and temperature factors for controlling food- borne pathogens.

The manager of the operation should be a HACCP team member and responsible for carrying out the procedures, monitoring, and recording of the data. He or she must be adequately trained so as to have a thorough knowledge of the application, monitoring, and recording of the data.

Increasingly, retailers are switching to "case ready" products, thus removing the retailer from any handling of raw meat. This reflects retailer concerns about potential contamination as well as savings in back-room labor.

Tenderness

Tender cuts of meat are preferred to meat that is difficult to chew.

Lean beef

Consumers are trending towards a leaner beef product. USDA revised and released new ground beef nutritional data October, 2002, based on 95% lean (previously 75%), reflecting the US trend towards leanness. The largest ground beef processor in Oregon grinds the majority of their production to a lean content of 85-93%.

Pricing

Price is a key factor for most consumers. However, it is not one of the top factors according to the Nevada survey. The consumer wants value for their food dollar but some are willing to pay even more for their meat as long as it has some of the traits they are interested in. As the table below indicates, some consumers are willing to pay up to \$4.33 per pound (\$10.23 minus \$5.90) more for local, grass fed NY steaks. And, consumers seem to be willing to pay 37 cents per pound more for local, grass fed ground beef.

Price per Pound

Willing to pay for:	New York steak	Ground beef
Undifferentiated (no label)	\$5.90	\$2.73
Locally grown	\$10.11	\$2.78
Grass fed (lean)	\$9.67	\$2.61
Both local and grass fed	\$10.23	\$3.10

Source: University of Nevada at Reno Study, p. 39.

Based on a recent poll conducted by Zogby International⁶, most Americans are willing to pay more for domestic meat. Some 70 percent of food shoppers say they're willing to pay more for produce, poultry, meat, seafood and other food products produced in the United States. One in three respondents said they would pay up to 10 percent more for U.S. food, and nearly half (46 percent) would be willing to pay from 10 to 25 percent more. Eleven percent said they

⁶ Gabbett, Janie, "Most Americans Willing To Pay More For Domestic Meat", August 16, 2007. The Zogby interactive survey of 4,508 adults nationwide was conducted July 17-19, 2007.

<http://www.meatingplace.com/MembersOnly/webNews/details.aspx?item=18658>

would be willing to pay 25 percent or more. Only 15 percent of respondents indicated they would not be willing to pay more.

The Zogby survey also showed that 90 percent believe knowing the country of origin of the foods they buy will allow consumers to make safer food choices, and 88 percent said they would like all retail food to be labeled with country of origin clearly marked. But wanting to know and going out of their way to check where a product originates are two different things. Only 11 percent said they always check product origin, while 37 percent said they check most of the time and 34 percent said they check occasionally.

Marbling

Marbling refers to the presence of strips of fat in the meat. Marbling generally enhances the meat's flavor, and tenderness. Grain fed beef tends to exhibit more marbling while grass feed beef has less of it. However, this can vary with the breed and age of the animal.

Animal Feed

The type of feed an animal eats has much to do with the meat's flavor, leanness, and texture. Some people prefer grain feed beef while others prefer grass feed beef. In general, consumers only felt this trait was moderately important.

Texture

A portion of USDA's grading standards deal with muscle texture. The firmer the meat, the higher the grade. Consumers do take this trait into consideration, however, it is only marginally important.

Promotions

Some consumers are enticed to purchase meat based on sales promotions and discount offers. According to the Nevada survey, 48% of the respondents said promotions were either very important or extremely important.

Packaging

Packaging must address more than food safety issues. It must be inviting to the consumer and provide the consumer with meaningful information including nutritional data and meal preparation and food handling procedures. Recyclable packaging presents the processor with an opportunity to differentiate the product provided the packaging assures product freshness.

Lifestyle

As if things weren't complicated enough, today's consumer is looking for products that fit their lifestyle and conform to their personal values. For example, products must be designed to facilitate ease of preparation. A January 2002 Food Marketing nationwide survey of shopping preferences showed that 85% of shoppers eat meals cooked at home three or more times per week. While convenience is growing in importance, only 44% of respondents to the 1997 American Strategies survey indicated that would be likely to purchase a pre-cooked or ready to eat product.

Personal Values

There is a relatively new subset of consumers that demands meat products exhibit certain special features. Factors such as humane treatment of livestock, environmentally friendly production processes, "natural", organic, locally grown and locally processed, all represent desirable characteristics of an appropriately branded meat product for this segment of the market. However, the size of this segment is unknown. Some feel this segment represents no more than 10% of the total market or less. Others think it may represent 30% of the market or more. It is clear that through farmers markets and community-supported agriculture projects (CSAs), in which people buy shares in a farm each year, more and more people are opting out of the "globalized food system" and investing in locally grown vegetables, fruits, meat and dairy products as a means of supporting agriculture, reduce energy consumption and improving their diet. In certain geographic areas like Portland, this segment of the market is large and growing. In rural eastern Oregon, this segment may be less dynamic.

When it comes to gaining a competitive advantage over larger, low cost producers and processors, this new level of consciousness offers meat purveyors new opportunities. It allows small suppliers to differentiate their wares in a way that allows them to offer products that others cannot. It allows suppliers to seek a premium for their meat. And, it can make small scale meat processing profitable.

One of the many challenges agricultural producers face today is the need to stay in tune with the ever-changing desires of the consumer. The need to innovate and differentiate products has never been greater. The competition to gain and hold market share has never been more intense. This is the result of a number of factors not the least of which are globalization and the consolidation of the food industry. Thus, anything producers and processors can do to add-value to their offerings by differentiating their products is a positive development.

Animal Rights

One of the more important issues consumers care about is animal rights. Consumers want to feel confident that their expenditures are not going to support the inhumane treatment of livestock. Consumers are increasingly concerned about the way animals are cared for and used by industry. Animal abuse will not be tolerated. Processing facilities must have the necessary equipment and be designed in such a way so as to minimize the potential for animal abuse.

Environmentally Impact

Consumers want to support companies that take their environmental impact into account. In this regard, a recent Hudson Institute⁷ study made a number of surprising findings. An excerpt of those findings is provided below.

For years, beef producers and most consumers, as well as scientists from all over the world, including the World Health Organization, recognized that growth promotants used in beef production not only improved efficiency but also were safe for both the environment and beef consumers. The Hudson Institute's Center for Global Food Issues recently conducted an in-depth environmental impact analysis of an Iowa State University study comparing two production methods — conventional, grain-based beef production using growth-promoting technologies and organic, grass-only beef production. The results were surprising, especially for the environmentalists who would like to believe an often-cited 2006 United Nations Food and Agriculture Report that claims beef production — and all livestock production, for that matter — are primary contributors to greenhouse gas emissions. The CFGI scientific analysis found that conventional beef production methods are more environmentally friendly than organic, grass-only production.

The ISU study found that because of increased production efficiency that growth promotants deliver, conventional production systems are three times more land-efficient than the organic, grass-only system and reduce greenhouse gas emissions more than 40 percent. By utilizing safe, FDA-approved technologies, beef producers actually are producing more pounds of beef per acre of land and are significantly reducing the amount of CO₂-equivalent emissions from methane gas produced by cattle. Producing more food with less land is critical when we consider the burgeoning world population, world hunger and increasing world demand for beef and other animal proteins.

⁷ Drovers News Source, "Conventional Beef Production — Less Environmental Impact", March 06, 2009.

http://www.drovers.com/directories.asp?pgID=675&ed_id=5284&component_id=805

Since only about 40 percent of the world's land mass is suitable for the production of food, feed and fiber to feed the world's growing population, it is critical that we use our farming resources — especially land — as efficiently as possible. Plus, environmentalists all over the world are increasing their efforts to conserve biodiverse natural habitats, which means increasing productivity is our only realistic and responsible option.

According to a 2008 paper by Searchinger et al. in Science magazine, clearing additional land for agriculture causes the release of significant CO₂ emissions from the soil and lost forest growth. These researchers estimate that each acre of land cleared for food production results in 10,400 pounds per acre per year of CO₂-equivalent greenhouse gases over the subsequent 30 years (based on estimated emissions from each type of land converted to cultivation in the 1990s). Using data from Iowa State University's Leopold Center for Sustainable Agriculture, the Hudson Institute analysis demonstrates that conventional, grain-based beef production's three-fold greater land use efficiency over organic, grass-based finishing results in even lower overall greenhouse gas emissions than directly attributable to beef production.

EPA scientists recognize that beef production contributes only 2 percent of the total U.S. greenhouse gas emissions compared to 80 percent for fossil fuel consumption. This recent ISU/CFGI research shows us that by maximizing production efficiency by using safe, available growth-enhancing technologies, we can minimize emissions even more. Growth promotants help make food more affordable for consumers and help the beef industry and consumers have an even greater positive impact on the environment. Increased production efficiency means more beef per acre of land, which means fewer acres will need to be cleared for cultivation, and lower greenhouse gas emissions.

Even if there is disagreement over the extent to which meat production harms the environment, processors would do well to remember this is an issue that many consumers are concerned about and steps must be taken to assure the consumer that raising and processing beef cattle does not harm the environment.

“Natural” Meat

“All natural” meat products are not clearly defined. It means different things to different people. Some consider meat that is hormone free, antibiotic free, free range, and sustainable managed as natural. However, other concepts such as associated with animal welfare and organic are also associated with natural. The consumer is looking for natural products. As of January 2009, “natural raised” on a meat label means that the animals were raised without the use of antibiotics or hormones at all during their lifetimes.

Organic Meat

Increasing demand for “organic” meat occurred after the first cases of *bovine spongiform encephalopathy* (BSE) which took place in the US and Canadian cattle in 2003. Organic beef sales have doubled each year since 2003.

Over the past 15-20 years, market savvy producers have sought to provide organic/natural products to consumers who are concerned about their health and the environment. The meat industry got on board with hormone and antibiotic free beef, chicken, and pork. Today, nearly 25% of American shoppers buy organic products once a week, up from 17% in 2000. Nationwide, the market for organic foods has soared from \$3.5 billion in 1997 to \$10.4 billion in 2003. Organic meat sales increased 51% in 2005 alone. The Organic Trade Association expects organic sales to reach \$50 billion per year by 2025. The trend toward organic food has proven to be a boon for agriculture.

Buy Local

Purchasing locally produced agricultural products is an important aspect of our food economy that benefits a significant number of individuals. It inspires people to think about where their food comes from and what it takes to produce it.

For many food purists, "local" is now the new "organic," the new ideal that promises healthier bodies and a healthier planet. There is even a name for these purists – localvores. Many chefs, food writers and politically minded eaters are concerned that organic production has “gone main stream” and large agribusinesses now use the same industrial-size farming and long-distance-shipping methods as conventional agribusiness. Localvores represent a group of people who hope to build a more locally based, self-reliant food economy - one in which sustainable food production, processing, distribution and consumption is integrated to enhance the economic, environmental and social health of a particular place. It is considered part of the sustainability movement.

One of the newer features of the buy local movement has to do with the concept of food miles. The desire to reduce “food miles” is thought to lessen the impact of green house gases on the environment by requiring less fossil fuel to transport products to market. For example, most produce in the US is picked 4 to 7 days before being placed on supermarket shelves, and is shipped for an average of 1,500 miles before being sold. And, this is taking into account only US grown produce. Food miles refer to the distance a food item travels from the farm to your home. The food miles for items you buy in the grocery store tend to be higher than the food miles for goods bought from local sources. Yet, critics assert that the concept does not tell the whole story and even products shipped

from a far can be less environmentally harmful than some locally produced items. Of course, imports are even less desirable because the travel much greater distances. Here's how the Local Harvest website describes the situation.

We can only afford to do this now because of the artificially low energy prices that we currently enjoy, and by externalizing the environmental costs of such a wasteful food system. We do this also to the detriment of small farmers by subsidizing large scale, agribusiness-oriented agriculture with government handouts and artificially cheap energy.

Cheap oil will not last forever though. World oil production has already peaked, according to some estimates, and while demand for energy continues to grow, supply will soon start dwindling, sending the price of energy through the roof. We'll be forced then to reevaluate our food systems and place more emphasis on energy efficient agricultural methods, like smaller-scale organic agriculture, and on local production wherever possible.

Cheap energy and agricultural subsidies facilitate a type of agriculture that is destroying and polluting our soils and water, weakening our communities, and concentrating wealth and power into a few hands. It is also threatening the security of our food systems, as demonstrated by the continued e-Coli, GMO-contamination, and other health scares that are often seen nowadays on the news.

These large-scale, agribusiness-oriented food systems are bound to fail on the long term, sunk by their own unsustainability. But why wait until we're forced by circumstance to abandon our destructive patterns of consumption? We can start now by buying locally grown food whenever possible. By doing so you'll be helping preserve the environment, and you'll be strengthening your community by investing your food dollar close to home. Only 18 cents of every dollar, when buying at a large supermarket, go to the grower. 82 cents go to various unnecessary middlemen. Cut them out of the picture and buy your food directly from your local farmer.

www.localharvest.org

Local food consumption as a practice and philosophy is expanding. In March 2009, an Illinois statewide task force report delivered to the Illinois Legislature presented a local farm-and-food development strategy that experts say could

trigger \$20 to \$30 billion in new economic activity every year, creating thousands of new jobs while revitalizing rural communities. There are 12.5 million people in Illinois. The report of the Illinois Local and Organic Food and Farm Task Force concludes that even small increases in the amount of food grown for local consumption can generate an enormous amount of new economic activity, all of it within the state, for farmers and others in food-related businesses. The report presents a strategy for increasing the amount of money spent on Illinois-grown food to 10 percent of the statewide total by 2020 and to 20 percent by 2030.

Those supporting the development of a local food economy believe that purchasing food items directly from small, specialized, local farmers will lead to a healthier community, environment, and enhance the local economy. They claim that shopping decisions, favoring local food consumption, directly affect the well being of people.

However, while the local food movement has been good for agriculture, for a number of reasons, there is more to the story. For all its charm and romance, supplying local customers does not pay the bills for most farmers. As much as 85% of the agricultural products produced in Oregon are sold out-of-state and 40% of those are exported to foreign countries. Meat processors will want to consider both local and regional market opportunities. Many local markets do not represent enough demand to pay the bills.

Branded Products

A recent Oregon Agri-business Council survey adds support to the Oregon consumer's desire for Oregon branded product citing that 78% of those surveyed had sought out an Oregon grown product. The desire to purchase Oregon grown products seems to increase income level, from 56% of the under \$25,000 to 93% at the highest income levels.

Branding is a way to differentiate your products. It is a way to associate your company and its products with specific attributes that consumers are looking for. But the claims you make, the images you invoke must have validity. Consumers are looking for authenticity. A couple of successful examples of beef branding include Oregon Country Beef and Painted Hills Beef.

Other

Consumers will purchase products that meet their needs if the product is priced appropriately. The Food Marketing Institute included the following product characteristics in their list of purchasing influencers in addition to the ones mentioned above: 1) nutritional value, 2) storability, 3) method and ease of preparation, and 4) preparation time.

Institutional Trade

Foodservice distributors that are regional or tend to support regional products can also be an important channel of distribution. Restaurants want the opportunity to feature locally grown products. Oregon is home to many institutional outlets that emphasize northwest cuisine. This market is an available target for premium Oregon beef. Local hamburger outlets like Burgerville offer yet another good target market.

Sizing up the Market

The table below gives the most recent population estimates for Oregon, by County. The consumption factors discussed above are characteristics of many of these Oregonians. The difficult part is to know which attributes are associated with which segments of the population. Unfortunately, this information is not available. Suffice it to say that consumers in Portland are probably more influenced by personal values and lifestyle characteristics than the average consumer living in rural Oregon. That's not to say one is right and the other is wrong. People are just different. It helps to understand these differences when you are trying to sell a product.

July 1, 2008 Population Estimates

County by Region	Population	Pct Chg 07-08
Benton	86,120	1.0%
Clackamas	376,660	1.2%
Clatsop	37,695	0.7%
Columbia	48,095	1.1%
Lane	345,880	0.8%
Lincoln	44,715	0.2%
Linn	110,185	0.8%
Marion	314,865	1.2%
Multnomah	717,880	1.1%
Polk	68,235	1.1%
Tillamook	26,060	0.8%
Washington	519,925	1.7%
Yamhill	94,325	1.3%
NORTHWEST	2,790,640	1.2%
Coos	63,210	0.3%
Curry	21,510	0.2%
Douglas	105,240	0.5%
Jackson	205,305	1.5%

Josephine	83,290	1.1%
SOUTHWEST	478,555	0.1%
Gilliam	1,885	0.0%
Hood River	21,625	0.7%
Morrow	12,485	1.2%
Sherman	1,845	-0.5%
Wasco	24,170	0.2%
Wheeler	1,575	0.3%
NORTH CENTRAL	63,585	0.5%
Crook	26,845	3.7%
Deschutes	167,015	3.9%
Jefferson	22,450	1.9%
Klamath	66,180	0.6%
Lake	7,585	0.3%
SOUTH CENTRAL	290,075	2.9%
Baker	16,455	0.1%
Grant	7,530	-0.7%
Harney	7,705	0.3%
Malheur	31,675	0.2%
Union	25,360	0.4%
Umatilla	72,380	0.2%
Wallowa	7,115	-0.2%
EASTERN	168,220	0.2%
TOTAL OREGON	3,791,075	1.2%

Source: Portland State University Population Research Center

Using these population figures as a guide, it is possible to estimate the size of the Oregon market for beef in terms of volume. The USDA estimates that the per capita consumption of beef was 62.8 pounds per year in 2006. Assuming that figure still represents consumption in 2008, the market for beef in Oregon may be estimated as follows:

$3,791,075 \times 62.8 \text{ lbs.} = 238,079,510 \text{ lbs./ year}$ or roughly 492,918 head of 1,000 lb. beef cows yielding 483 lbs. of marketable meat each (see: page 37).

USA Per Capita Consumption on Meat (2002-2006)-POUNDS

Year	Beef	Pork	Lamb	Chicken
2002	64.2	48.4	0.9	56.8
2003	61.6	48.6	0.8	57.5
2004	62.7	48.1	0.8	59.2
2005	62.4	46.5	0.8	60.4
2006	62.8	46.3	0.8	61.6

Source: USDA Economic Research Service

Business Models

Producing meat products for public consumption is a complicated undertaking. As changes in technology made it possible to slaughter more animals, meat processing companies began to consolidate operations and smaller, less efficient plants were put out of business. Indeed, over the past twenty years, nearly 500 USDA inspected slaughter facilities have closed across the USA. To survive, smaller meat processors must be efficient, sanitary and know their customers. Even then, small scale processors are unlikely to be the low cost producer given transportation costs alone and to say nothing of their inability to generate economies of scale.

However, small meat processors do have some important advantages. First, slaughtering large numbers of animals makes it more difficult to control all the variables. Small meat processors can better track and manage production. Niche markets require specialized meat products like organic meat. A small processor can better manage keeping different kinds of meat separate. Small processors offer a personal touch that high volume processors cannot match.

Mobile Meat Processing

There has been a great deal of interest recently in an USDA inspected mobile slaughtering unit after the success of the San Juan Islands, Washington operation⁸. The idea is that a mobile unit such as the one pictured below would travel to farms and ranches accompanied by a USDA inspector and slaughter beef, sheep and hogs. Such a unit may be purchased and made ready for about \$200,000.

⁸ See: http://www.extension.org/pages/Island_Grown_Farmers_Cooperative for a detailed case study of this operation.



Of course, there are costs associated with operating such a unit. The San Juan Islands unit's annual operating costs are about \$290,000. Kathleen Painter at the University of Idaho has developed a spreadsheet that is useful in estimating operating costs for a mobile slaughter unit, based on the Thunder Hooves unit in Walla Walla, Washington. She can be reached at (208)885-6041; [e-mail=kpainter@uiidaho.edu](mailto:kpainter@uiidaho.edu).

Item	
Mobile Slaughter Unit	\$140,000
Misc. supplies	\$5,000
Truck tractor	\$45,000
Validation testing/HACCP plan	\$4,500
Staff training	\$2,000
Total	\$196,500

Source: Univ. of Nevada at Reno feasibility study

One of the issues with this kind of unit centers around a concern over who will take profit/loss responsibility for operating the unit. According to Bruce Dunlop (the manager of the San Juan Lopez Island, WA mobile unit), there are two common difficulties associated with building a USDA inspected mobile slaughter unit: finding funding and finding someone with the desire to operate the business. Those who already have a custom exempt mobile slaughtering facility are usually fully booked and have no desire to put money into inspection.⁹ The unit must be driven to specific ranches according to a schedule and process a variety of animals. Cleaning the equipment and disposing of the waste materials are important aspects of this process just as they are with all meat processing operations. Ranchers are charged a processing fee and all the work is done with

⁹ Martin, Aurora and Debra Sohm Lawson, "Solving the Local Meat Conundrum: Meat Production and Processing in Oregon and Washington", November 2005.

a federal inspector on site. The processing fee ranges from \$50 to \$100 per head.

It is important to recognize that a mobile unit cannot perform all the required functions without a connection to a stationary meat processing facility. Processed meat must be transported in the mobile unit to the stationary processing plant for storage, cutting and wrapping, all of which must be under inspection if the final products will be sold. This is difficult to do "in the field".

Stationary Fabrication Facility Start-up Costs

Here are some estimated start-up costs for a stationary meat processing plant. These figures are only meant to give the reader a "ball park" idea of what it might cost to set up a stationary meat processing business. Each entrepreneur will have a different situation and may be able to significantly reduce these costs. Please keep in mind that this facility is not designed to slaughter animals. A slaughter facility costs more. The mobile unit slaughters the animals.

Item		
10,000 SF building @ \$130 SF	\$1,300,000	
Fees	\$15,000	
Land @ \$2K per acre	\$4,000	\$1,319,000
Office Equipment		
Communication system	\$2,000	
Computer network	\$3,800	
Computer workstation (5)	\$16,000	
Printer/Fax/copier/scanner	\$5,000	
Office furniture	\$9,500	\$36,300
Viscera Equipment		
1,000 lb. capacity hoist	\$2,000	
Paunch working table	\$18,000	
Tripe inspection ring	\$700	
Utility and wrapping table	\$900	\$21,600
Cutting Room Equipment		
Bagging table w/ stainless steel rack	\$4,000	
Bone chip removal system	\$300	
Bone collector set for grinder	\$1,500	
Carcass dropper	\$1,600	
Cutting board	\$200	
Vacuum packing machine	\$10,000	
Double section boning table	\$6,000	
Grinder	\$5,000	

Grinder cutting tool set	\$1,200	
Heating element for sterilizer	\$1,000	
Cutting table (stainless steel)	\$1,900	
I-beam trolley	\$100	
Pre-cut evacuation system	\$5,000	
Stainless steel saw sterilizer	\$1,000	
Stainless steel band saw	\$6,000	
Static scale w/ digital weight indicator	\$4,700	
Utility and wrapping table	\$4,000	
Wheel caster assembly	\$1,000	\$54,500
Refrigeration		
10' x 30' freezer unit	\$30,000	
10' x 30' refrigeration unit	\$30,000	\$60,000
Total		\$1,491,400

Source: University of Nevada at Reno Study

Of course, it may be possible to use the mobile unit to slaughter livestock under USDA inspection and transport the carcasses to an existing USDA inspected meat processing facility for additional processing. This would save the owner(s) of the mobile unit from having to invest in a new stationary meat processing facility.

The Nevada Model

The goal of the University of Nevada Reno study was to determine the feasibility of increasing the producer's share of total meat processing revenues by allowing the producer to process and sell meat under a local brand name. Researchers sent out 800 surveys in fall 2005 and got 153 (20%) responses representing 70% of northern Nevada's livestock production. 91 producers said they were interested in looking at establishing a new business entity using a mobile slaughter unit. However, the group was quick to recognize that a mobile unit was not enough. They needed a facility capable of handling the meat once it was processed by the mobile unit. Therefore, the initial plan called for two mobile units and one 10,000 square foot plant on one acre.

The Nevada plan called for grants, loans and member contributions to fund the project. 40 ranchers were asked to contribute \$5,000 each and another 51 ranchers were asked to contribute \$2,500 each. This combined with two loans totaling nearly \$2 million and a grant of \$200,000 would fund the project.

<u>Cost</u>	<u>Financing</u>
Land and Building = \$1,333,369	40 ranchers @\$5K + 51 @ \$2.5K = \$375,000
Furniture / fixtures = \$36,360	grant / investor = \$200,000 (common stock)
Processing equip. = \$136,100	Loan #1 @ \$1,505,829 = monthly payment of \$15,273
(2) mobile units = \$413,650	Loan #2 @ \$413,650 = monthly payment of \$5,240
working capital = \$575,000	
total = \$2,494,488	total = \$2,494,488

Researchers proposed a business model calling for the formation of a producer cooperative that would buy livestock at market price, process it, and sell the meat to customers developed by the coop. The coop would then distribute profits to coop members. The operation was expected to process 2,400 beef, 4,000 sheep and 136 hogs per year generating \$4.5 million in sales owing to "premium pricing" of brand named cuts. However, even at this level of sales, the project was not expected to generate a positive cash flow.

Although the report mentions the importance of promotion in generating sales, the financing estimate does not budget anything for promotion (advertising, brochures, point of purchase materials, sales calls, etc.). Typically this can amount to from 3-8% of gross revenues.

So far, the Nevada coop has failed to materialize. By and large, producer coops are not favored by producers. They can be difficult to manage. Thus, without an entrepreneur, this plan may not go forward despite all the producer interest.

The Beef Cows Contribution

The information provided below is offered to serve only as a rough guide to assist the entrepreneur to determine what it will take to be financially successful in the meat processing business by estimating revenues for a hypothetical beef cow. This will vary by processor, type of animals, and market conditions. The assumption here is that a 1,000 pound animal results in a hanging weight of 690 pounds, and will yield a total of 483 pounds of meat after processing (cut and wrapped). Efficiency is critical to the success of a small plant.

The table includes an estimate of the wholesale price of each cut of meat. This again is simply an approximation. The price received by the processor will vary by location and customer base. Some processors will sell direct to the consumer. Retail pricing will generate larger revenues than shown here. Others will sell to distributors or other retailers (wholesale pricing). Which ever the case, or combination thereof, it's important to estimate revenues and associated costs of production to determine whether or not a particular business is financially feasible.

The example below suggests that a 1,000 lb. beef cow will generate nearly \$1,360 in revenue at wholesale. Approximately 69% of the animal can be recovered as meat and 31% will represent bone, fat and shrink. If the cow costs 89 cents/lb. on the hoof, the return to the entrepreneur after processing the animal is roughly \$465 per animal before processing and marketing costs. If the processor sells direct to the public, the retail cuts of meat will sell for significantly more than they prices used here. And, if the processor is able to differentiate the product, the price received could be even higher. The table gives a conservative view of the potential for revenue.

Choice Grade Sub-Primals

Live weight = 1,000	Use Factor	Hanging Weight lbs.	Cut and wrapped	Wholesale Price (lb)	Est. Value
ROUND					
Top round	0.0346	34.6	24.2	\$1.66	\$40.22
Bottom round	0.0334	33.4	23.4	\$1.53	\$35.75
Tip	0.0215	21.5	15.1	\$1.77	\$26.69
Rump	0.0078	7.8	5.5	\$1.55	\$8.51
Ground beef	0.0405	40.5	28.3	\$1.16	\$32.85
	0.1378	137.8	96.5	\$1.49	\$144.03
LOIN					
Porterhouse steak	0.0300	30.0	21.0	\$6.00	\$126.00
T-bone steak	0.0152	15.2	10.7	\$3.30	\$35.18
Top loin steak	0.0083	8.3	5.8	\$2.36	\$13.72
Sirloin steak	0.0665	66.5	46.5	\$4.12	\$191.68
Ground beef	0.0046	4.6	3.2	\$1.85	\$5.98
	0.1246	124.6	87.2	\$4.27	\$372.56
FLANK					
Flank steak	0.0057	5.7	4.0	\$3.05	\$12.15
Ground beef	0.0212	21.2	14.9	\$1.81	\$26.90
	0.0269	26.9	18.8	\$2.07	\$39.05

RIB					
Rib roast	0.0391	39.1	27.4	\$3.68	\$100.66
Rib steak	0.0200	20.0	14.0	\$4.11	\$57.54
Short ribs	0.0075	7.5	5.3	\$1.64	\$8.65
Ground beef	0.0100	10.0	7.0	\$1.81	\$12.67
	0.0766	76.6	53.6	\$3.35	\$179.53
PLATE					
Plate, stew & short ribs	0.0665	66.5	46.5	\$2.49	\$115.84
CHUCK					
Blade roast	0.0978	97.8	68.5	\$1.43	\$97.94
Arm pot roast	0.0368	36.8	25.7	\$1.87	\$48.13
Cross rib pot roast	0.0340	34.0	23.8	\$1.57	\$37.37
Ground beef	0.0529	52.9	37.0	\$1.47	\$54.46
	0.2215	221.5	155.1	\$1.53	\$237.90
BRISKET					
Boneless brisket	0.0169	16.9	11.8	\$1.46	\$17.30
FORESHANK					
Shank meat	0.0138	13.8	9.7	\$1.53	\$14.83
MISCELLANEOUS					
Kidney, hanging tender	0.0057	5.7	4.0	\$1.00	\$3.98
Total		690.5	483.3	\$2.33	\$1,125.02
FAT, BONE & SHRINK	0.3095	309.5	309.5	\$0.75	\$232.13
Grand Total		1,000.0	792.8	\$1.71	\$1,357.15
LESS:					
Purchase price for live animal (lb)		1,000.0		\$0.89	\$892.87
Revenue per animal		1,000.0		\$0.46	\$464.28

Disclaimer: The wholesale price data was adapted from information prepared by the National Cattlemen's Association for February 27, 2009. These are average prices and not specific market prices. The data was collected by the USDA. Prices change on a weekly basis. This information presented here only serves as a rough estimate for educational purposes. This is also true for the estimated yields of each primal cut. Yields vary from one processor to the next.

Processing Plant Economics

So what does it cost to process an animal? The Oregon Department of Agriculture purchased meat processing industry profiles from Integra Information. Integra Information uses 32 different databases including data from the US Department of Commerce and the US Department of Labor to determine

the financial characteristics of companies operating in various industry sectors. Firms operating in SIC code 2011 were used. Information was pulled from about 285 firms with annual revenues between \$500,000 and \$999,999 per year. Here are the average costs.

EXPENSES	Percent of Gross Revenues
Cost of Goods	83.8%
Gross Margin	16.2%
Selling, General & Admin	6.1%
Officer compensation	5.6%
Pension & benefits	0.8%
Advertising & sales	0.6%
Rents	0.3%
Depreciation and amortization	0.9%
Operating Expenses	14.3%
Net Income Before Tax	1.9%

Source: Integra Information; <http://www.integrainfo.com/>

This means, on gross revenues of \$464,000¹⁰, the entrepreneur could expect to see net income before taxes of \$8,816. This amount serves as the firms retained earnings for the year less taxes. It will not take much to put this operation in the red.

Others have spent time trying to estimate operating costs based on different levels of production. Jay Norton of UC Davis¹¹ developed the following list of expenses for a 2,000 head and 1,000 head production operation. These estimates DO NOT include slaughtering costs incurred by a mobile processing unit for example.

Fabrication Facility Expenses

Estimated Costs	2000 head	Pct.	1000 head	Pct.
General & Administrative				
General manager	\$40,000	6.9%	\$40,000	10.3%
Payroll tax & benefits	\$10,000	1.7%	\$10,000	2.6%
Telephone	\$4,077	0.7%	\$2,716	0.7%

¹⁰ \$464,000 is the expected return from processing 1,000 head. See page 37.

¹¹ Norton, Jay, "Facilitating Direct Sales of Meat Products in Tuolumne County, California: A Progress Report, March 9, 2006. (unpublished)

Internet	\$240	0.0%	\$240	0.1%
Insurance	\$4,500	0.8%	\$4,500	1.2%
Licenses & permits	\$150	0.0%	\$150	0.0%
Office supplies	\$2,621	0.5%	\$1,746	0.5%
Accounting & legal fees	\$2,330	0.4%	\$1,552	0.4%
Auto expenses	\$492	0.1%	\$492	0.1%
Advertising and sales	\$0	0.0%	\$0	0.0%
Postage	\$540	0.1%	\$540	0.1%
Bank charges	\$192	0.0%	\$192	0.0%
Facility rents	\$0	0.0%	\$0	0.0%
Facility capital loan payments	\$52,353	9.0%	\$52,353	13.5%
TOTAL G&A	\$117,495	20.2%	\$114,481	29.5%
Labor				
Meat cutters	\$167,221	28.7%	\$83,600	21.5%
Cleaning help	\$5,760	1.0%	\$5,760	1.5%
Wrappers	\$88,011	15.1%	\$44,000	11.3%
Payroll tax & benefits	\$65,248	11.2%	\$33,340	8.6%
Utilities				
Electricity	\$38,275	6.6%	\$38,275	9.9%
Water	\$360	0.1%	\$360	0.1%
Operations				
Microbiological testing	\$11,648	2.0%	\$7,759	2.0%
Laundry	\$8,154	1.4%	\$5,431	1.4%
Equipment repair	\$3,960	0.7%	\$3,960	1.0%
Equipment calibration	\$200	0.0%	\$200	0.1%
Pest control	\$360	0.1%	\$360	0.1%
Rendering & disposal	\$9,901	1.7%	\$6,595	1.7%
Small tools	\$7,571	1.3%	\$5,044	1.3%
Supplies	\$58,240	10.0%	\$38,796	10.0%
TOTAL CUT & WRAP	\$464,909	79.8%	\$273,480	70.5%
TOTAL	\$582,404	100.0%	\$387,961	100.0%

Matching Revenues and Expenses

Can a small beef processing facility be profitable? If costs are controlled and sales materialize, there is a reasonable chance of success. Let's assume that an entrepreneur slaughters, processes and sells 1,000 animals per year. Using the pro forma sub primal cuts menu, the business could generate return of \$464 per animal, at wholesale prices, after paying the market rate for the animal. Since these figures do not include a slaughtering fee, that must be added. Assume a

\$75 per animal for slaughtering. The information prepared by Jay Norton suggests that it should cost just over \$400,000 to operate the business. However, a 3% promotional/advertising expense must be added.

Revenues	Year 1	% of revenues
1000 head @ \$464	\$464,000	100%
<hr/>		
Expenses		
Slaughter fee	\$34,800	7.5%
G&A	\$114,481	24.7%
Promotion	\$13,920	3.0%
Labor	\$166,700	35.9%
Utilities	\$38,635	8.3%
Operations	\$68,145	14.7%
total expenses	\$436,681	94.1%
Net income before tax	\$27,319	5.9%
Tax @ 15%	\$4,098	
Retained earnings	\$23,221	5.0%

With an assumed tax rate of 15%, the entrepreneur could expect to retain about \$23,000 per year by processing and selling 1,000 animals at wholesale prices. The Integra data predicts a small return but neither scenario leaves much chance for error.

The calculation at 2,000 animals per year is more attractive. Using the same approach outlined above, processing 2,000 animals per year could net the entrepreneur more than \$209,000. Processing 2,000 animals per year equals 40 per week (50 week year) and should satisfy 13,949 individual customers.

Gaining market share is the issue. If several ranchers use the services of an USDA mobile unit, have their meat processed at a USDA stationary plant, and finally take possession of the meat for sale to local retailers or restaurants, I sure you can appreciate the fact that competition will be intense for local market share. Each rancher will have similar production costs and similar processing costs while product differentiation will be more difficult. Therefore, each rancher must ask the question, how can I gain market share from my neighbor and from traditional retailers?

The Oregon Country Natural Beef Model¹²

Oregon is fortunate to have a number of producers who saw an opportunity to sell meat to consumers in a new way. One example is Oregon Country Beef. Another is Painted Hills Beef. Each of these firms have had a great deal of success in the market without owning or operating a processing facility. Here, in their words, is how they describe their business.

OCB is a member cooperative of 40 cow/calf beef ranchers in Oregon, with 16 prospective members from Oregon, Washington, Idaho, Nevada and California. An additional 15 ranch families are considering joining the cooperative. The organizational goal was drafted by the original 14 ranchers in 1986 by stating, in part that, "Our goal is to provide a sustainable means through a group to profitably market quality beef products desired by the consumer while retaining every possible bit of independence." After one year of selling beef through retail outlets, OCB was officially incorporated by 14 ranch families in 1987 in the State of Oregon. The mission statement (1991) reaffirms the cooperative's value placed on making the rancher the key decision-maker, and the sustainability of the land and health of the animals a key factor. OCB maxed out the 10,000 mother cows of the original 14 members after 13 years. The ranches vary in size from the smallest with 60 mother cows to the largest with 4,000 mother cows. Most of the ranches have between 600 and 1400 mother cows. Ranching is the primary income generating activity for all the members.

OCB does not own plant or equipment. Rather, they partner with the feedlot and slaughterhouse and have developed relationships with these businesses that are mutually beneficial to the ranchers and the processors. Washington Beef, the meat packer located in Toppenish, Washington, has benefited from its business relationship with OCB and considers OCB a valued partner. OCB believes that Washington Beef deserves every penny they earn on the OCB relationship, because of the "costs of production, return on investment, and a reasonable profit" objective. Washington Beef processes about 500 animals per week for OCB. OCB's meat is separated from all other meat processed in the Washington facility.

The "purchased" product is high quality, natural beef. The 40 full members OCB ranchers have approximately 65,000 cow/calf pairs (all marketed cattle raised from birth) and 2.5 million acres of rangeland. OCB producers are certified by the Food Alliance and are required to manage by Grazewell principles. OCB partners with Beef Northwest in Boardman, Oregon (custom feedlot owned by OCB member rancher John Wilson) for finishing and generally averaging 89 days

¹² This information was taken from the Oregon Country Natural Beef website. It is the company's description of their business. <http://www.oregoncountrybeef.com/>

on the feedlot after 12-18 months of grazing. The finishing is done with a 30% grain ration as opposed to the standard 80% ration as it is ecologically indefensible to feed excessive amounts of grain to fatten up an animal past the point of health both for the animal and the consumer. They target high-select or low-choice grades to get the best mix between taste and tenderness. They have had outside verification of the quality and nutritive content of their beef conducted by Texas A & M University. They strive to produce their beef using feed that is free of GMO, antibiotics hormones and/or other growth implants. Products are sold through partnerships with natural foods grocers (such as Seattle-based PCC and Whole Foods) and restaurants. Their emphasis on having each of the member ranch families visit stores once a year is key to their organizational values and marketing strategy.

“De-commodify or die!” The economic goal of Oregon Country Beef is to keep ranchers stewarding the land. OCB prefers not to look at economics as how much more money they make than conventional beef producers. They learned early on that the economics of beef is about “cost of production, return on investment, and a reasonable profit.” They have done exhaustive accounting of their costs of production and costs of marketing and set their prices based on this accounting regardless of “market” prices. If the price they put on their meat is too high for consumers, they believe they would have to get out of the business and because if they can’t meet their costs and a reasonable profit, they would have to stop producing. They have estimated, however, that they have averaged nearly \$120 per animal profit over the market price for the last 10 years. When market prices rose above OCB profits in 2003, they did not change their pricing because they felt it had no bearing on whether they kept ranchers on the land. In addition to the pricing strategy and marketing efforts, OCB has worked diligently to streamline their production, feeding and slaughter operations.

OCB has experienced significant growth over the years. However, the difficulty of planning for growth is exacerbated by the fact that it can take over 2 years from the time growth rates are projected to the time a product is ready (conception to birth, rearing the animal, finishing the animal, slaughter, packing and marketing). They have had to turn away potential customers because they are unable to meet this demand, and have even invited in Coleman Natural Beef (a Colorado-based competitor) to help them meet their commitments. In addition, OCB recently became the keystone product of Burgerville USA, a upscale hamburger restaurant chain near Portland, Oregon that values Food Alliance certified products. In order to meet growing demand, OCB is bringing new ranch families into the cooperative. The capital buy-in for the cooperative is cattle. They attempt to have each new ranch provide one “truckload” of calves in the first year (roughly 60, 800 pound feeder calves) and slowly bring them up to their full capacity. This also enables the new ranch

families to get the carcasses in condition suitable for the OCB quality program. Each rancher finances their animal from birth to the retail cooler and commits to retail needs 12-18 months in advance of delivery. They do not purchase in feeder steers to meet their commitments. The individual ranchers are responsible for consumer product satisfaction. Administrative costs for the cooperative are kept to a bare minimum, and are assessed per animal sold (i.e. Marketing gets \$25 / head). Whole Foods has been slightly more than half of the business and the new partnership with Burgerville USA has made it possible for OCB to market all cuts of meat.

Dramatic growth in demand for sustainable, natural beef creates a tremendous opportunity for growth of Oregon Country Beef. The current 56 member ranches are now maxed out in their cattle and OCB is adding another 15 ranches, including some in Washington, Idaho and Montana. One issue that faces OCB is balancing expansion with their dedication to consensus decision-making and having all members represented on the Board of Directors. 18 years of functioning this way and slowly expanding the membership has made it a very successful strategy, but it is a strategy that requires incredible patience and persistence.

OCB has been very pro-active in forging new business and marketing strategies. They have capitalized on past research, education and policy work, such as the establishment of Food Alliance by WSDA, WSU and OSU. They have also capitalized on the growing awareness consumers have over the production, safety and quality of their foods. Further research, education and policy changes promoting sustainable agriculture and food systems would be beneficial to OCB and similar strategies. Another example of how they have overcome policy barriers for their market strategy was to form a cooperative that would give them sufficient scale to operate in wholesale markets and meat processing. OCB's feeding, slaughter and processing standards are quite stringent and the cooperative strategy enables them to deal with state and federal meat inspection standards that many smaller beef producers attempting alternative markets struggle to overcome.

Conclusion

While market demand for "alternative" meats is growing faster than for any other segment of U.S. food sales, increasing frustration is faced by farmers, ranchers, institutions, retailers and consumers due to a shortage of one key element in Oregon: the meat processor. When small- or mid-sized plants are available at all, they often lack the capacity, equipment, appropriate inspection status, and the human and financial capital to upgrade and/or expand. This is not to demean existing meat processors. Oregon's USDA inspected processing plants have their hands full obtaining live animals and processing them at a cost that still leaves

room to compete. As a result, less than 5% of Oregon raised livestock are processed in Oregon.

The public's changing demand for meat products seems to offer enterprising producers and processors with opportunities that fit a small scale, sustainable meat processing business model. But there are issues. A state meat inspection program may aid small scale producers but it may also be cost prohibitive. The lack of rendering facilities in Oregon will continue to keep waste management costs elevated for some time.

The economics of meat processing on a small scale are challenging. Many look to the advantages offered by a USDA inspected mobile unit. However, a mobile unit does not offer all the services needs to process meat. A stationary facility is also required. Taken together, the plant and equipment required to carry out this model can be expensive and processing only a few head per year is unlikely to justify the investment.

Organizations and individuals from around the state have been trying to help prospective entrepreneurs seek out solutions. Guidance and resources can be difficult to find. This report attempts to pull together much of the work already done by numerous individuals in the hope that this will assist entrepreneurs evaluate a path forward.

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