

# GRAIN PROCESSING: ADDING VALUE TO FARM PRODUCTS

VALUE-ADDED TECHNICAL NOTE

*Abstract: Value-added processing is a strategy used by some grain growers to keep their farming operations viable. This publication introduces ideas that have worked for some farmers, provides sources for equipment, and lists sources of further information.*

By **Janet Bachmann** and **Lance Gegner**  
NCAT Agriculture Specialists  
November 2002

## INTRODUCTION

Farmers who grow oats, wheat, rye, barley, corn, and other grains are looking for ways to command better prices. But while many farmers dream of getting a share of the value that is added to their crop after it leaves the farm, only a few actually succeed. Those who do increase their profits through on-farm processing generally don't get there quickly or easily (Kessler, 1989). Adding value requires doing more work, investing in additional supplies and equipment, possibly hiring more help, and definitely dealing with additional rules and regulations.



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The following examples of grain farmers who have gone into a variety of processing enterprises are just that: examples. They are presented not to suggest a specific blueprint but to give ideas about what can be done.

## FIRST, LEARN ABOUT REGULATIONS

Hilgendorf's Whole Grain Milling Company, just outside Welcome, Minnesota, is an example of a successful on-farm milling operation. Lyn and Doug Hilgendorf have been farming or-

### Related ATTRA publications:

Evaluating a Rural Enterprise  
Adding Value to Farm Products: An Overview  
Direct Marketing  
Keys to Success in Value-Added Agriculture  
Organic Marketing Resources  
“Green” Markets for Farm Products  
Eco-Labeled Foods: Profit or Problems?  
Marketing Organic Grains  
Moving Beyond Conventional Cash Cropping  
Organic Livestock Feed Suppliers  
Alternative Agronomic Crops

ganically for about 15 years. Their crops include corn, soybeans, oats, wheat, rye, and buckwheat.

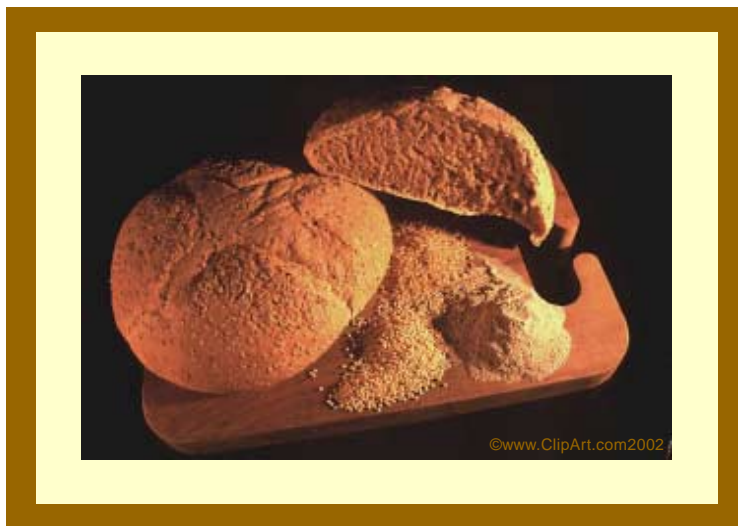
About ten years ago, Doug and his brother Ralph began to discuss processing and marketing their own grains. “The price of grain was below the cost of production,” says Ralph. Grains are now milled, mixed, and bagged on the farm and sold to individuals, retail outlets, and bakers. Ralph notes that since the products are for human consumption, it is important to keep everything clean—free of dust, cobwebs, and rodents. In regard to information sources, Ralph said that some could be found in the public library and others through the local Extension Service. However, he strongly advises anyone considering processing to talk with state Department of Agriculture officials first to learn about regulations (Hilgendorf, 1999).

## WHOLE-GRAIN FLOUR

Larry Nordhus, a Kansas wheat, corn, and soybean grower, has been grinding whole-wheat flour for “10 or 15 years.” He grinds the whole berry, including bran and germ. He says he started out doing a little bit for relatives for their home baking. “I started with a hand-crank mill,”

he says, with a chuckle. “I motorized it right away. Then I answered an ad for a mill that would ‘make cake flour with your own grain.’ I got one of them and it speeded up the process.” Then someone referred him to a bakery that used whole-wheat flour.

He is now using a mill that runs off a tractor, “bought used and rebuilt to serve the purpose.” The flour is packaged in 50-pound food-grade paper bags, which he says can be found in any large city. In regard to wheat varieties, Larry says he is using an old standby variety. He advises would-be flour makers to experiment to find the right variety for their own markets. “Grind a gallon of each [of several varieties] and go to the baker [with the flour] to find what works well for them. Stay with that variety so that the flour will be consis-



tent for the baker from batch to batch.” (Nordhus, 1999)

Another Kansas couple who started home-scale grain grinding that grew into a business are Gerry and Larry Yost. In an interview a number of years ago for *The Furrow* (Kessler, 1989), Gerry told about the many details that needed attention: “I didn’t have any trouble coming up with a name and a logo, but after that, I really didn’t know where to begin. Fortunately, I’ve been able to find a number of people with answers who have been willing to help me. But even with that, there are so many decisions to make and details to work out that it’s almost overwhelming.” The task list included:

- Remodeling a room, making changes to comply with health department regulations
- Modifying two kitchen food mills to handle a larger volume of grain
- Locating weighing and packaging equipment
- Finding someone to design a logo
- Getting labels printed
- Lining up a packaging supplier

Gerry advises starting out with a top-quality product, preferably one that has some feature that sets it apart from the competition. The Granary, as she calls her enterprise, sells only wheat, farm-grown without insecticides. All of the grain is thoroughly cleaned at a nearby elevator, then tested at a private laboratory to make sure its protein content and baking quality meet Gerry's standards.

Her primary product is whole-wheat flour packaged in 2- and 5-pound plastic bags. Whole-kernel wheat, a cracked-wheat cereal, and a combination pancake-and-waffle mix Yost developed herself complete her product line. Each item is also packaged in smaller plastic bags and decorated glass jars for sale as gifts. Recipes and tips for storing whole-wheat products are included with each item. They are sold in stores and gift shops in north-central Kansas.



## ADDITIONAL PRODUCTS

David Vetter returned to his family's 280-acre farm in 1975 intending to grow grains organically (Vetter, 1999; Cramer, 1993). Dave soon realized that to really succeed as an organic grain farmer, learning to *grow* organically was only half the battle. He'd also have to help develop the processing and marketing infrastructure to deliver those grains to consumers. In 1980, Dave and his father, Don, invested \$170,000 to build a small grain-cleaning plant. The operation has grown into Grain Place Foods, Inc., employing 13 people full time to grow, clean, process, package, and market grains and beans for its own line of products as well as for other food companies.

The facility includes grain storage with forced-air drying capability; a state-of-the-art gas-fired infrared processing toaster (to stabilize the oils in the grains); bagging, packaging, and labeling equipment; and a refrigerated warehouse. Grain Place Foods products include:

- Ready-for-retail and bulk flaked cereals and mixes, including rolled oats, wheat, barley, rye, rice, triticale, spelt, kamut, and soybeans
- Microwave and regular popcorn
- Organic livestock-feed ingredients, including full-fat soymeal, cracked corn, and crimped oats and barley
- Organic birdfeeds

Although the business was initially conceived as a way to add value to grains grown on their own farm, Dave says they now grow only 3 to 5% of the grains processed. Additional grain is purchased from organic farmers from as far away as Canada and Nicaragua.

In regard to the difference between the price that farmers receive for their grain and the retail price of the final product, Dave says, "Sometimes they think they are being gouged. But that's because few of them are aware of the costs and work that go into cleaning, processing, packaging, and marketing." He cites some examples:

- The labeling machine that prints lot numbers and expiration dates on packages costs about the same as a used, mid-sized tractor in good condition.



- Nutrient analyses to comply with FDA nutritional labeling requirements cost from \$500 to \$6,000 per product. The costs of organic certification, licensing, permitting, and plant and scale inspections all add up. To satisfy buyers' requirements, the farm and processing plant have been certified by as many as five different groups.
- Economies of scale determine the cost of distribution. "It costs 15 to 30 cents a pound to ship a pallet. But I can send a semi-load for less than six cents a pound."

Dave emphasizes that high quality is important. "Post-harvest handling and storage present a big opportunity for farmers to improve quality, and they'll be rewarded in the marketplace," he says. "Most of the premium is for the extra care and service you provide that high-quality product."

Dave strongly encourages anyone considering starting a value-added business to take the University of Nebraska's "From Product-to-Profit" course offered through the Food Processing Center Business Development Office (see [Educational Training Resources](#)). He says it is the best entrepreneur-training program in the U.S. Of those who complete the course and then start their own business, 80% are successful, compared to a national average of only 8%. He also notes that of those who take the introductory course, 80% decide not to go into a value-added business.

## ANIMAL FEED

Animal feed production is another niche for grain growers. The Vermont Organic Grain Company was founded as a result of Gerry Coleman's search for organic feed grain (Kittredge, 1995). To put the story in a nutshell: Gerry and others were looking for a bulk storage facility and found an abandoned grain mill instead. "We weren't looking for a facility like this. But we turned this up and said, 'Bingo!' There's a need for organic

feed. More people than us would want it. Maybe this is what we should do. It has taken much longer than we ever anticipated. I learned a lot more about business than I ever wanted to know; we're not business people. We're farmers who are trying to get this thing started because we think there's a need for it."

The mill has its own siding platform where a railroad car or truck can dump feed into a chute.

There an auger picks it up and carries it to a bucket elevator that can take the grain anywhere inside. Counting the outside bins, the mill can store about 20 traincar loads in a number of different storage hoppers. This gives the facility a lot of flexibility in creating custom mixes. The mill has a full range of internal equipment: grinders, mixers, baggers, and equipment to

steam, cool, and pelletize feed. It has chutes above the truck loading area and a scale to weigh vehicles. A platform next to the bagging station also facilitates truck loading.

Freshness is a primary concern—once a grain is ground, it starts to oxidize. Another difficulty is state regulations. "You have to register feed in each state where you sell it," Gerry explains. "You have to tell the department of agriculture there exactly what's in it: protein, fat, fiber, etc. So there has to be enough volume for a mix in a state to pay the registration fee there."

A similar operation is that of Mel Gelsing in Robesonia, Pennsylvania (Cicero, 1995). When Mel switched from conventional to organic production, he had trouble finding outlets for much of his organic corn, soybeans, and small grains. Then he met some farmers who wanted to raise their livestock organically but couldn't find organic feed. For six years, he sold whole corn and soybeans, and the farmers did their own milling. Then he was convinced to put up a mill. His fully computerized mill and storage bins cost \$320,000. The mill became operational in 1982, with his own crops accounting for only three percent of his milling volume. It supplies feed for broiler operations, dairy and beef cows, horses, and exotic livestock.

*"We're farmers who are trying to get this thing started because we think there's a need for it."*

*Gerry Coleman*

## COOPERATIVES

More than 1,000 North Dakota, Minnesota, and Montana wheat farmers joined forces to form a cooperative to turn their top-quality hard amber durum wheat into pasta. The Dakota Growers Pasta Company in Carrington, North Dakota, produces and markets spaghetti, linguine, fettuccine, macaroni elbows, and egg noodles. The company shipped its first product in December 1993; it is now the third-largest pasta company in the U.S. The farmer-owners' initial investment of \$12-million dollars (based on bushels delivered, minimum 1,500 bushels) was used to raise the \$42-million capital investment that built the mill and pasta plant. A nine-member board of directors, all active farmers, oversees all aspects of the business. In May 2002, the members of the cooperative voted to change to a common stock corporation. For additional information about Dakota Growers Pasta Company, visit <<http://www.dakotagrowers.com/>>.

Liz Reinhiller, who works with the Dakota Growers Pasta Company, says that the cooperative concept is a good one. If farmers who have a crop that is special to their area can get together and can find a market, they can put together a business plan and build a solid business team. She notes that some ventures have failed because they didn't have a good marketing or business plan, and may not have had a good management team with the best interests of the growers in mind (Reinhiller, 1999).

The Mountain View Harvest wheat growers' cooperative in Colorado has gotten into the wholesale bakery trade with "par-baked" (partially baked) breads (Campbell, 1997). This is a growing segment of the baking industry, in which breads and rolls are baked to within ten percent of completion, then flash-frozen and shipped to restaurants. Critical to the birth of Mountain View Harvest was a grant from USDA Rural Business and Cooperative Development Service for a business feasibility study. Members had some ideas for products, but they knew they needed a thorough marketing study to find out what was truly promising. Grower-members raised \$5-million of the \$6-million needed to purchase a

bakery and grain elevator, thus minimizing the amount of borrowed money needed.

For producers exploring the possibility of forming a marketing cooperative, the best source of information is USDA's Rural Business and Cooperative Development Service (RBCDS). The RBCDS helps farmers and rural residents form cooperative businesses and improve the operations of existing cooperatives. They provide technical assistance, conduct cooperative-related research, and provide informational products to promote public understanding of cooperatives. For additional information contact:

USDA/RBCDS Cooperative Services

AG Box 3255

Washington, DC 20250-3255

(202) 720-7558

e-mail: [coopinfo@rurdev.usda.gov](mailto:coopinfo@rurdev.usda.gov)

<http://www.rurdev.usda.gov/rbs/coops/csdir.htm>

### USDA/RBS Publications Available from ATTRA

(call 1-800-346-9140 to receive a copy)

Cooperative Services: What We Do,  
How We Work

How to Start a Cooperative  
Small Fresh Fruit & Vegetable  
Cooperative Operations

Understanding Cooperatives: Ag  
Marketing Cooperatives

Cooperative Feasibility Study Guide  
Cooperative Farm Bargaining & Price  
Negotiations

Cooperative Marketing Agencies-in-  
Common

## ***EDUCATIONAL AND TRAINING RESOURCES***

A 2001 award from the USDA created the Agricultural Marketing Resource Center (AgMRC). The AgMRC brings together experts from four of the nation's leading agricultural universities—Iowa State University, Kansas State University, the University of California, and Oklahoma State University—into an electronically based center to collect and interpret information about value-added agriculture. The AgMRC will create an electronic hub that connects producers and businesses to knowledge, research, organizations, business resources, and ongoing activities in the agricultural sector. The Center has an online directory listing value-added state resources (See **Further Resources: Websites**).

Many state land-grant university departments of food science and state departments of agriculture are good places to begin gathering information. Some states have specific agricultural development centers to assist their producers in developing new agricultural products and markets for adding value to their farm products (see **Further Resources: Some State Sources of Value-Added and Development Information**).

The Nebraska Food Processing Center Business Development Office has an Entrepreneur Assistance Program that offers the "Recipe to Reality" seminar, "Product to Profit" individualized consultation, and additional assistance to help existing businesses expand into new markets. For information about these and other services, contact Arlis Burney at:

Nebraska Food Processing Business  
Development Office  
University of Nebraska-Lincoln  
60 Filley Hall  
Lincoln, NE 68583-0928  
(402) 472-8930, Fax: (402) 472-8831  
<http://www.fpc.unl.edu/>

The Northern Crops Institute is a collaborative effort among North Dakota, Minnesota, Mon-

tana, and South Dakota for promotion and market development of crops grown in the four-state region. The Institute provides educational courses, customized training, and technical assistance in many value-added, processing, and marketing areas for northern crops.

Northern Crops Institute  
Bolley Drive  
Fargo, ND 58105-5183  
(701) 231-7736

<http://www.northern-crops.com>

The American Institute of Baking is a non-profit center for education and research that offers correspondence courses, seminars, and customized training, as well as books and technical bulletins on all aspects of baking.

American Institute of Baking  
1213 Bakers Way  
PO Box 3999  
Manhattan, KS 66505-3999  
(785) 537-4750, (800) 633-5137, Fax: (785)  
537-1493

<http://techserv.aibonline.org>

Kansas State University is the only university in the world offering a four-year degree program in milling and a separate program in baking. Dr. Dale Eustace, head of the Department of Milling, Kansas State University, offers this advice to farmers considering on-farm grain milling:

- Stay with whole-grain flour. A stone mill for small- to medium-scale whole grain flour production can be purchased for \$15,000 to \$20,000. A stone mill will work well for most people. You can adjust the stones to get the appropriate grind, experimenting to see what suits your market. A tabletop grinder can be used, but the capacity of these is low.
- To process wheat into white flour, a business would need to invest a million dollars or more for the mill alone. Additional capital would be needed for other components of the facility.
- Call your state capital to find out who handles regulations. In some states it is the department of agriculture. In other states it will be another agency.

Dr. Eustace is willing to talk with people who call, and he can provide help specific to your situation. He can be contacted at:

Dr. Dale Eustace  
Department of Milling  
Kansas State University  
Manhattan, KS 66506  
(785) 532-4063  
e-mail: [dde@wheat.ksu.edu](mailto:dde@wheat.ksu.edu)

## SUMMARY

Resources for specific information on grain processing are fairly scarce and hard to find. Most of the farmers interviewed developed their products through their own trials and errors. Value can be added to grains in many different ways, resulting in the development of new products or the improvement of existing ones. Anyone interested in starting a food processing business has to spend a great deal of time looking for information on such topics as federal and state regulations, labeling, ingredients, packaging, financing, and marketing.

## FURTHER RESOURCES

### WEBSITES

**Agricultural Marketing Resource Center**  
<http://www.agmrc.org/>

*The Agriculture Marketing Resource Center collects and interprets information about value-added agriculture. The Center is creating an electronic hub that connects producers and businesses to knowledge, research, organizations, business guidance, and ongoing activities in the agricultural sector. The Center has an online directory listing value-added state resources.*

Mary Holz-Clause  
101B EES Building/Haber Road  
Ames, IA 50011  
(515) 294-0648, Fax: (515) 294-0684  
e-mail: [mclause@iastate.edu](mailto:mclause@iastate.edu)

or

Don Hofstrand  
2023 S. Federal Ave.  
Mason City, IA 50401  
(641) 423-0844, Fax: (641) 423-2642  
e-mail: [dhof@iastate.edu](mailto:dhof@iastate.edu)

### USDA Farmer Direct Marketing

<http://www.ams.usda.gov/directmarketing/index.htm>

*USDA Farmer Direct Marketing website is an excellent source of publications, resources, and links to direct marketing materials. It also has a Farmers Market Directory and a Direct Marketing Resources by State listing.*

### University of Georgia Extension

<http://www.ces.uga.edu/pubcd/b1051-w.html>

*Online publication Getting Started in the Food Specialty Business.*

### Illinois Institute for Rural Affairs

[http://www.iira.org/pubsnew/publications/IVARDC\\_Other\\_5.pdf](http://www.iira.org/pubsnew/publications/IVARDC_Other_5.pdf)

*Online publication Starting a Value-Added Agribusiness: The Legal Perspective.*

### Minnesota Department of Agriculture

<http://www.mda.state.mn.us/dairyfood/startingfoodbiz.pdf>

*Fifty-six page online publication Starting a Food Business in Minnesota.*

### North Dakota State University Extension

<http://www.ext.nodak.edu/extpubs/agecon/market/ec1137w.htm>

*Online publication Developing a New Co-Owned Agricultural Business: How Do We Start a Value-Added Firm?*

### University of Tennessee Extension

<http://www.utextension.utk.edu/pbfiles/pb1399.pdf>

*Online publication Getting Started in a Food Manufacturing Business in Tennessee.*



## Wisconsin New Farm Options

<http://www.uwex.edu/ces/agmarkets/>

*A web-resource from University of Wisconsin Extension that provides information about new niche markets and business start-up issues, and about others like you who are pioneering new farm-food ventures.*

## BOOKS

### **Educational Concerns for Hunger Organization (ECHO) on-line Book Store:**

#### **Traditional Foods: Processing for Profit.**

1997. Peter Fellows, editor. \$45.00.

*Deals in part one with basic concepts of hygiene, processing methods, and quality assurance. Part two covers all kinds of processed foods. Emphasis is placed on quality-control aspects of raw-material selection, processing, and packaging.*

#### **Small-Scale Milling.**

1994. By Lars-Ove Jonsson, David A. V. Dendy, Karen Wellings, and Varis Bokalders. 129 p. \$29.50.

*Essential reading for anyone involved in the milling of cereals in developing countries; target reader is the extension agent promoting improved small-scale milling. It covers technical, economic, social, and nutritional/health aspects of milling.*

## Starting a Small Food Processing

**Enterprise.** 1996. By Peter Fellows, Ernesto Franco, and Walter Rios. 123 p. \$15.00.

*Brings together important aspects of both the technological and business skills needed to start and operate a small food-processing business successfully. The emphasis is on thorough planning before the enterprise is established and then on careful control of production to minimize costs and maintain the desired product quality.*

**Baking for Profit.** 2000. By George Bathie. 124 p. \$17.50.

*Intended to help people establish a successful bakery business or improve an existing small bakery. Takes the reader, step by step, through the stages of market research to establish evidence of a need for a bakery business in a particular location, and methods for determining the likelihood of success.*

### Order from:

Educational Concerns for Hunger  
Organization (ECHO)

17391 Durrance Road

North Fort Myers, FL 33917

(239) 543-3246, Fax: (239) 543-5317

[http://echonet.org/shopsite\\_sc/store/html/foodprocessing.html](http://echonet.org/shopsite_sc/store/html/foodprocessing.html)

**Volunteers in Technical Assistance (VITA) publications (see their complete catalog at <http://www.vita.org/publications/pubcat.htm>).**

**Small Scale Maize Milling.** VITA Publication. 143 p. \$16.50.

*Describes various milling techniques for production of whole meal, bolted meal, and super-sifted meal. Covers all processing stages.*

**Grain Mill for Home Use.** By Walter B. Booker. VITA Publication. 9 p. \$5.25.

*Easy-to-build wooden grinder for corn, wheat, and other grains.*





**Home Flour Mill.** By Walter B. Booker. VITA Publication. 14 p. \$5.25.  
*This mill is made almost entirely of wood. Powered by a 1/4-hp electric motor, by wind power, or by hand.*

Order from:

PACT Publications  
1200 18th Street, NW  
Washington, DC 20036  
(202) 466-5666, Fax: (202) 466-5669  
email: [pubs@vita.org](mailto:pubs@vita.org)  
<http://www.pactpublications.com>

### OTHER BOOKS

The following books are available from bookstores and online booksellers. If a book is listed as out-of-print, you may be able to obtain it through Interlibrary Loan; check with your local librarian. You may also be able to buy a copy through an online used-book search site, such as <<http://www.bookfinder.com/>>.

**Small-Scale Grain Raising.** 1977. By Gene Logsdon. Rodale Press, Emmaus, PA. 305 p. Out-of-print.  
*Covers production aspects of a large number of grains, including corn, wheat, sorghum, oats, and soybeans. Also provides information on harvesting, storage, grinding, and cooking. Three basic kinds of grinders are described: 1) burr mills with either stone or steel burrs, 2) the roller mill, and 3) the hammer mill. Of the three, Logsdon favors the burr or gristmill for grinding flour. He says that none of the whole grain is lost in a burr mill, and generally speaking, it grinds finer, although you may have to run your meal through it twice to get the finest flour.*

**Adding Value for Sustainability: A Guidebook for Cooperative Extension Agents and Other Agricultural Professionals.** 1998. By Kristen Markley and Duncan Hilchey. 110 p. DIANE Publishing Company.  
*Discusses the concept of value-added processing and how it contributes to sustainable agriculture, introduces four enterprise owners who share their experiences in small-scale processing, and presents a description of issues involved in the start-up of a business.*

**The Bread Builders: Hearth Loaves and Masonry Ovens.** 1999. By Daniel Wing and Alan Scott. 253 p. Chelsea Green Publishing Co., White River Junction, VT.  
*Provides information about making old-fashioned naturally fermented hearth or artisan loaves of bread, and how to plan, build, and operate masonry ovens.*

### SOME STATE SOURCES OF VALUE-ADDED AND DEVELOPMENT INFORMATION

California Small Farm Center  
University of California  
One Shields Avenue  
Davis, CA 95616-8699  
(530) 752-8136, Fax: (530) 752-7716  
<http://www.sfc.ucdavis.edu/>

Iowa Center for Crops Utilization Research  
Dr. Lawrence Johnson  
1041 Food Science Building  
Iowa State University  
Ames, IA 50011  
(515) 294-0160, Fax: (515) 294-6261  
<http://www.ag.iastate.edu/centers/ccur/>

Illinois Value-Added Rural Development Center  
Illinois Institute for Rural Affairs  
Stipes Hall 504  
1 University Circle  
Macomb, IL 61455  
309 298-2674 or 800 526-9943  
<http://www.value-added.org/>

Kansas Technology Enterprise Center  
214 SW 6th, First Floor  
Topeka, KS 66047  
(785) 296-5272, Fax: (785) 296-1160  
<http://www.ktec.com/erc/>

Minnesota Agricultural Utilization Research Institute  
Michael Sparby  
PO Box 599  
Crookston, MN 56716-0599  
(800) 279-5010  
<http://www.auri.org>

Missouri Value Added Development Center  
143 Mumford Hall  
Department of Ag Economics  
University of Missouri  
Columbia, MO 65211-6200  
(877) ValueAdd (824-8233), Fax: (573) 884-6572  
<http://valueadded.missouri.edu/index.htm>

Nebraska Cooperative Development Center  
Jo Lowe  
The Atrium Bldg.  
1200 "N" St., Suite 610  
Lincoln, NE 68508-2022  
(402) 471-2698, Fax: (402) 471-8690  
Toll-Free (877) 814-4707 or (877) 496-5235  
for NE only  
<http://www.rdc.state.ne.us/coop/>

North Dakota Marketplace of Ideas  
Headquarters  
Marilyn K. Kipp, Executive Director  
411 Main Street West  
Mandan, ND 58554-3164  
(888) 384-8410, (701) 663-0150, Fax: (701) 663-1032  
<http://www.marketplaceofideas.com/>

Oklahoma Food and Agricultural Products  
Research and Technology Center  
148 FAPC  
Oklahoma State University  
Stillwater, OK 74078-6055  
<http://www.okstate.edu/ag/fapc/>

Tennessee Agricultural Development  
Center  
University of Tennessee  
307 Morgan Hall  
Knoxville, TN 37996-4521  
(865) 974-3824, Fax: (865) 974-9492  
<http://www.utextension.utk.edu/adc>

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p. 35-38.

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communication. Welcome, MN.

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big. The Furrow. November-December.  
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communication. Centralia, KS.

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Company, One Pasta Ave., P.O. Box 21,  
Carrington, ND 58421-0021, (701) 652-  
2855.

Vetter, David. 1999. Personal communication.  
Marquette, NE.

## APPENDIX

### RESOURCES FOR FINDING CLEANING AND PROCESSING EQUIPMENT

Processfood.com  
200 Daingerfield Road  
Alexandria, VA 22314  
(703) 684-1080, Fax: (703) 548-6563  
[http://www.fpmsa.org/productLocator/  
bakery/index.cfm](http://www.fpmsa.org/productLocator/bakery/index.cfm)

*An online search of bakery equipment, suppliers,  
and services provided by the Food Processing  
Machinery and Supplies Association  
(FPM&SA), a non-profit trade association  
founded in 1885 to provide a business link  
between food & beverage processors and  
suppliers.*

GrainNet  
3065 N. Pershing Court  
Decatur, IL 62526  
(800) 728-7511, Fax: (217) 877-6647  
<http://www.MillingEquipment.com>  
*An online Milling Equipment Buyer's Guide that allows searches by company or by products and services.*

Seed World  
380 E. Northwest Hwy.  
Des Plaines, IL 60016-2282  
(847) 298-6622, Fax: (847) 390-0408  
*Seed World is published monthly with an extra issue in April. The U.S. subscription rate is \$30/year. The Annual Buyer's Guide includes contact information for suppliers of bag-closing equipment, bag-filling machines, bags, bins, blowers, cleaners, etc.*

Implement & Tractor™  
2302 West 1st Street  
Cedar Falls, IA 50623-1879  
(800) 959-3276, Fax: (319) 277-3783  
*Implement & Tractor™ is published bimonthly with an extra issue in December. Subscription rate is \$30/year. Their Ag Equipment Buyer's Desk Reference includes listing and contact information for many various types of mills, cleaners, etc.*

Feedstuffs  
Circulation Department  
191 S. Gary Ave.  
Carol Stream, IL 60188  
(800) 441-1410, (630) 462-2224  
*Feedstuffs Annual Reference Issue contains directories for companies supplying goods and services to the feed and feeding industries, association and grain inspection agencies, and a listing of products and services. Reference Issues are available for \$40.*

## **CLEANING AND PROCESSING EQUIPMENT MANUFACTURERS AND SUPPLIERS**

Meadows Mills, Inc.  
1352 W. D Street  
PO Box 1288  
North Wilkesboro, NC 28659  
(800) 626-2282, (336) 838-2282, Fax: (336) 667-6501

<http://www.meadowsmills.com>  
*Manufactures stone burr mills, or gristmills, ranging from 50 to 1250 lbs. per hour capacity, along with other related bakery equipment.*

The CS Bell Co.  
170 West Davis Street  
PO Box 291  
Tiffin, OH 44883  
(419) 448-0791, Fax: (419) 448-1203  
<http://www.csbellco.com>  
*Products include hammer mills and burr or gristmills, and corn shellers. The hammer mills are recommended for livestock and poultry feed preparation, grinding yard waste for compost, or fruit, vegetable, and grain processing for table use.*

Schmidt Flour, Inc.  
Box 99  
Maple Creek, Saskatchewan S0N 1N0  
(306) 666-4800, Fax: (306) 666-4838  
<http://www.schmidtfLOURinc.com>  
*Flour mills ranging in scale from 200 to 4000 lbs. per hour, and a debranner.*

Forsbergs, Inc.  
PO Box 510  
1210 Pennington Avenue  
Thief River Falls, MN 56701  
(800) 654-1927, (218) 681-1927, Fax: (218) 681-2037  
<http://forsbergs.com>  
*Gravity and screen separators, destoners, and hullers/scarifiers.*

Seedburo Equipment Company  
1022 W. Jackson Blvd.  
Chicago, IL 60607  
(800) 284-5779, (312) 738-3700, Fax: (312) 738-5329  
<http://www.seedburo.com>  
*Machinery and equipment for small-scale planting, harvesting, cleaning, and grinding of grains; some equipment specially designed for research and quality control. Catalog available on request.*

Kansas Wind Power  
13569 214th Road  
Holton, KS 66436  
(785) 364-4407  
[http://www.kansaswindpower.net/Grain\\_Mills.htm](http://www.kansaswindpower.net/Grain_Mills.htm)  
*Source of various styles of grain mills.*

The Country Baker  
8751 N. 850 E  
Syracuse, IN 46567  
(866) THE-BAKER, (219) 834-2134, Fax:  
(219) 834-3993  
<http://www.countrybaker.com/cataloglist.cfm>  
*Small-scale professional baking equipment and grain mills.*

C.F. Resources  
PO Box 405  
Kit Carson, CO 89825  
(719) 962-3228  
<http://www.cfamilyresources.com>  
*Small-scale professional baking equipment and grain mills.*

Lehman's  
Dept. 2-KNK  
Box 41  
Kidron, OH 44636  
(888) 438-5346, (330) 857-5757  
<http://www.Lehmans.com>  
*Look under Kitchen Implements for the mills and other equipment. Catalog is \$3.*

Country Living  
14727C 56th Avenue NW  
Stanwood, WA 98292  
(360) 652-0671  
<http://countrylivinggrainmills.com>  
*Manual and electric table grain mills.*

K-Tec Kitchen  
1206 South 1680 West  
Orem, UT 84058  
(800) 748-5400 or (801) 222-0888  
<http://www.k-tecusa.com>  
*Offers an electric-powered table mill to grind corn, wheat, rice, soybeans, anything not wet or sticky, at rate of over 1 pound per minute.*

R & R Mill Company, Inc.  
45 West First North  
Smithfield, UT 84335-0187  
(801) 563-3333  
*Hand cranked and motorized mills, primarily for home use.*

GrainMaker  
Wild West Machine  
Randy & Bonnie Jones  
370 Sharrot Hill Loop  
Stevensville, MT 59870  
(800) 965-3075  
<http://www.grainmaker.com>  
*Hand cranked mills for home use.*

Heartland Ag-Business Group  
1003 Central Avenue  
Fort Dodge, IA 50501  
(800) 247-2000  
<http://www.farmequipmentguide.com>  
*Provides a free-of-charge locating service for all types of used farm equipment and machinery.*

By **Janet Bachmann** and **Lance Gegner**  
**NCAT Agriculture Specialists**

**Edited by Richard Earles**  
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The electronic version of **Grain Processing: Adding Value to Farm Products** is located at:  
HTML  
<http://www.attra.ncat.org/attra-pub/grainpro.html>  
PDF  
<http://www.attra.ncat.org/attra-pub/PDF/grainpro.pdf>