

IMPACTS

on

Oklahoma's Agricultural Products Processing Industry

Annual Report
1999



Oklahoma Food and Agricultural Products Research and Technology Center
Oklahoma State University
Division of Agricultural Sciences and Natural Resources

Contents

Executive Summary 3

Business, Marketing and Economics 4

Educational and Quality Programs 6

Technical Assistance 8

Research 10

Appendices

Industry Advisory Committee 13

OSU Value-Added Faculty 14

FRIP Projects, 1998-99 15

Assisted Start-up Companies, 1997-2000 15

Active FAPC Projects, 1999-2000 16

Completed FAPC Projects, 1999-2000 18

Oklahoma Food and Agricultural Products Research and Technology Center



148 FAPC
Stillwater, Okla. 74078-6055
Phone (405) 744-6071
Fax (405) 744-6313
www.okstate.edu/ag/fapc/



Publisher/Managing Editor/Photographer:
Stephanie M. Greenlee

Cover Photos: Value Added Products processing facility and investors Mike Dunker, plant construction supervisor, and Richard Partington, Alva Farmer's Cooperative manager and VAP board member.



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The Oklahoma Food and Agricultural Products Research and Technology Center

Oklahoma has traditionally been a strong producer of agricultural commodities, ranging from cattle, pork and poultry to wheat, cotton, peanuts and pecans.

In the fall of 1996, the state of Oklahoma, in partnership with Oklahoma State University, established the Oklahoma Food and Agricultural Products Research and Technology Center on the Oklahoma State University campus.

The Food and Agricultural Products Center, or FAPC as it is more commonly called, has developed from a new 110,000 square foot building, void of equipment or personnel three years ago, to a bustling facility that serves Oklahoma's developing agriculture-based processing industry. Today, more than 95 faculty, staff and students work in the modern laboratories and pilot processing facilities.

This is the third annual report for the center, describing the people and programs that are having a significant effect on Oklahoma.

The programs of the center can be categorized as follows: Business and Marketing Assistance, Technical Assistance, Applied and Basic Research and Outreach Education. No single program carries more importance than the others, but it should be noted that in the first three years, business and technical assistance has been the major effort of center personnel.

This occurred because the center's greatest amount of expertise originated in these two areas. As the center moves forward, business and technical assistance will always have a place of importance, but additional efforts will be made to build the research and outreach education programs to equal levels. The future strength of the center will rely on the balance of all four of its programs.

Another strength the center has built during the past three years is the team approach to developing and delivering its programs. This annual report will show the effectiveness of staff working as teams to bring needed expertise in engineering, science, technology and business to projects that serve entrepreneurs and processors alike.

The body of this annual report

will provide examples of center projects and how they have helped existing processors solve problems, expand product lines and markets, meet new regulatory standards, and improve quality standards of their operations and products. This report also provides examples of the successful efforts of entrepreneurs, who with assistance from the center have been able to successfully start a new business in Oklahoma.

Unfortunately, space limits us from fully describing all of our efforts this past year, but the appendices to this report give a complete listing of FAPC assisted start-up companies, as well as active and completed FAPC projects for the past year.

As the Director of this program, I must give credit for the many successes that have been associated with the center during this past year to its excellent staff, the many OSU Value-Added faculty and staff that support center programs, and administrations of both OSU and the Division of Agricultural Sciences and Natural Resources that facilitate center efforts, as well as the many commodity producers and processors across Oklahoma that continue to work hard to make this program a success. Of the latter group, special recognition must be given to the center's sixteen-member Industry Advisory Committee for their tireless support and guidance during the past three years.



Lowell D. Satterlee
Director, Oklahoma Food and Agricultural Products Research and Technology Center

Start-up and Expansion

From concept to reality—this is an overall goal of the FAPC’s business and marketing staff.

Woodward oil man Bill Bonny charmed the taste buds of friends, relatives and catering clients for 27 years with his barbecue sauces.

Upon capturing first-place in a competition at the state capital and having multiple suggestions for commercialization, Bill and his wife Chris attended one of the center’s “Basic Training” workshops to find out how they could market their sauces in retail grocery stores.

Bonny took the knowledge gained at the July 1999 workshop to begin the business planning process. He returned to the center for review of his business plan and a processed foods evaluation on his sauces, including uniformity, taste and color

characteristics.

With the aid of Chuck Willoughby, FAPC business and marketing specialist, and Mike Clark, “Made in Oklahoma” director, Bonny’s sauces are now on the shelves of more than 25 retail grocery stores across northwest Oklahoma, and are co-packed by Richardson Foods in Oklahoma City.

Bonny services more than a 500-mile area two days each week, turning out 90 cases of sauce (a dozen bottles per case) to supermarkets, including nine United Supermarket Stores. Bill’s Kitchen BBQ Sauce also is being test-marketed by a Kroger supermarket in Plano, Texas, the nation’s largest grocery-store chain.

The sauces are available in two

flavors, “mild” and “not so mild,” but Bonny has plans to introduce “Honey Mustard” and “Campfire Smoke” later this year.



Bill Bonny, formulator of Bill's Kitchen BBQ Sauces.

A group of Woods County producers and businessmen aspired to create a business that would allow them to transform their hard red winter wheat into value-added products and stimulate local economic growth.

With the assistance of Rodney Holcomb, FAPC agricultural economist, a successful business plan was devised, leading to the development of Value Added Products (VAP), a closed-cooperative located at Alva, Okla.

The 700-member cooperative is comprised of Oklahoma wheat farmers, Alva businessmen, bankers,



Pizza processing equipment, Value Added Products, Alva, Okla.

Woods County Economic Development Committee members, the Woods County Industrial Authority and members of Oklahoma farmer cooperatives. Together, this group raised more than \$7.5 million in less than three months.

Objectives of this venture are to add value to Oklahoma wheat by producing high-quality food products using raw agricultural commodities and state-of-the-art technology to meet consumer desires for high-quality food products. Goals also include enhancing economic development activities and food processing ventures in rural

communities.

VAP is manufacturing frozen dough products in its new plant at Alva. Products include pre-proofed frozen artisan breads such as baguettes (round, elongated French-roll) and self-rising pizza crusts with production capabilities for batards (small French roll) and sweet goods such as yeast-risen donuts, sweet rolls and puff pastries.

The plant turned out their first production to a buyer in February 2000. The plant is expected to be in full-production by late summer to mid-fall, turning out approximately 50 to 60 million pounds of dough

per year or about 4,500 pizzas per day. The operation is expected to employ as many as 130 workers by the third year, increasing to about 160 by the fifth year. Plans have been made to add a second line to the \$18 million operation in the next few years.

VAP plans to continue to capture portions of the price spread between the farm and retail



VAP employees add the touch of hand-rolled edges to pizza crusts.

store, as well as product line expansion.

Promotion

In conjunction with the Oklahoma Department of Agriculture, FAPC business and marketing specialists are assisting Oklahoma processors through a demonstration program sponsored by J.B. Pratt, owner and operator of nine retail grocery stores in central and southern Oklahoma.

This program furnishes food companies the opportunities to demonstrate, promote and sell their products to the retail consumer, evaluating first hand the variety of responses that ultimately determines the product's success.

Although there is not a participation fee, the participant must be a client of the

FAPC and a member of the ODA's "Made in Oklahoma" program.

The client also must provide the required supplies (product, souffle cups, forks, spoons, napkins, etc.), have a current product liability

policy (as well as the manufacturer if the product is co-packed) and verification that the product meets all criteria for food safety requirements and consumption.

Upon the Pratt's store manager's evaluation, an invitation may be extended for a second demonstration.

If product sales reach a level established by Pratt's corporate office, the product may be placed into their warehouse for distribution to all Pratt's stores.

Approximately 50 clients have taken advantage of this opportunity, with five of those in Pratt's warehouse and about 30 delivering directly to a Pratt's store location.



Jim Brooks, FAPC business and marketing specialist, assists with set-up of demonstration booth at one of nine Pratt's retail grocery store locations.

HACCP Training

More than 140 of Oklahoma's small meat processors attended a series of accredited Hazard Analysis of Critical Control Points (HACCP) workshops at the Food and Agricul-

tural Products Center last year.

The workshops were hosted by the FAPC to assist the state's processors in meeting the Jan. 25, 2000 deadline established by the USDA for implementation of HACCP.

Officials from the USDA, the Oklahoma State Department of Agriculture's Meat Inspection Service and the FAPC assisted in developing HACCP plans tailored to

each production facility.

HACCP training began in March 1999 and ran through September. Industry participants were required to attend three, eight-hour workshops in order to complete the training.

Although initial efforts by the USDA to mandate HACCP in meat and poultry establishments are complete, it is the FAPC's belief that governmental mandated HACCP will extend to all food processors. The center is currently developing HACCP training for non-meat processors in order to prepare them for the event.



Kevin Nanke, FAPC meat scientist, assists meat processor with HACCP plans.

Industry Roundtable Discussions

Food processors interested in learning about issues related to food safety and discussing topics of individual concern with government regulators were invited to attend an on-going series of roundtable discussions hosted by the FAPC.

The discussions are designed to serve as an educational tool to inform food processors of issues related to food safety, e.g. packing technology, microbiology, food irradiation, crisis management and sanitation.

The first half of each meeting provides time for discussion among food processors, leaving the afternoon open for questions fielded by representatives from USDA's Food Safety Inspection Service and the

Oklahoma Department of Agriculture's Meat Inspection Service.

The roundtables not only provide an educational component, but also allow processors and regulators an opportunity to discuss areas of mutual interest and concern.

Participant feedback indicates a side benefit of the roundtables is the breaking down of barriers that exist between regulators

and processors.

It is the FAPC's goal to continue to facilitate these types of meetings in an effort to improve communication throughout the agricultural and food industries.



An audience of food processors, researchers and educators listen as Thomas Allen of the Titan Scan Corp. discusses the future of electronic pasteurization of foods.

Quality Management

Many Oklahoma food processors are small companies with limited resources.

The center continues to play a vital part in helping Oklahoma processors with their daily operating issues and maintaining quality management objectives.

Frank McKee, FAPC quality management specialist, focuses on several essential areas for a quality management program.

Management leadership and development, coupled with business

and strategic planning, are among the first issues addressed. Following these areas, attention focuses on determining and meeting client demands, a necessary and vital step to maintain competitiveness in today's business environment.

Once the important foundation is established with management, the next step moves toward developing the company's human resources, then toward the process itself and how information is gathered and used to drive the business. Particular

attention is paid to the results and how these results are used to make the necessary adjustments to every facet of the business.

As companies learn to operate in a total quality management framework, positive changes will begin to occur. It is the FAPC's goal that these changes will lead to value-added product opportunities for processors and other food related industries in our state.

Program Assessment

A primary goal of the FAPC is to develop and deliver educational programs.

Topics have ranged from HACCP training for small meat processors to the basics of starting a small food processing business.

However, program evaluation is just as important as the workshops themselves, a vital component in determining if the preparation, marketing and presentation of the programs are providing benefits to participants.

The center's Food Research Initiative Program (FRIP) funded the research by OSU's Robert Terry,

Jr. and graduate student Meghan Mueseler (Department of Agricultural Education) to develop instruments for the evaluation of the center's educational programs, with the goal of enhancing the overall quality of the FAPC's educational programs.

The evaluation model will help center educators to identify participant characteristics; their perceptions of the program's content quality, presentation style and professionalism; and the level of knowledge gained by the participants.

This data will be used in the

continuous improvement of FAPC educational programs.

A similar program has just been started for the evaluation of the center's technical assistance programs.

Kathleen Kelsey and graduate student Julie Bond (Department of Agricultural Education) have interviewed clients in order to assess the effectiveness of the center's technical assistance efforts.

The data gathered will help center staff maintain a level of excellence expected by Oklahomans.

Horticultural Processing

Today's market offers a multitude of "seedy" oils, but there soon could be a "nutty" new gourmet addition—pecan oil.

Reduced-fat pecan oil, pecan dressing and pecan bits offer new ways of thinking about nuts.

Family owned and operated, Tulsa's Knight Creek Farms has worked with Oklahoma State University in developing a new line of value-added products with nutmeats and extracts. The Knights said they have always seen potential for new products as technology continued to advance.

Beginning with OSU scientists in the departments of Biosystems and Agricultural Engineering, Horticulture and Landscape Architecture and Nutritional Sciences,



FAPC student workers assist with a pilot production of Knight Creek Farm's pecan oil for market studies.

product research eventually turned to the specialists at the Food and Agricultural Products Center.

William McGlynn, FAPC horticultural processing specialist, continued testing and research on the original formulation for a salad dressing and pursued the commercialization of a salad or cooking oil and defatted pecan bits.

Upon tackling the shelf-stability and formulation challenges, the center's state-of-the-art pilot processing facility allowed McGlynn to prove the products' viability during pilot-scale production. This pilot run gave the Knights insight on necessary equipment, as well as a supply of products for market studies. If the studies prove successful, the Knights intend to structure a new processing facility in Oklahoma.

Shelf-Stability

Chef's Requested Foods, Oklahoma City, is rapidly growing as a custom meat processor for the food service industry and a recognized brand name in the retail grocery market.

As the business has expanded, the processor's line has diversified to meet the demands of the industry and consumers.

Shelf-stability has played an essential role in product success.

Siobhan Reilly, FAPC food microbiologist, assisted Chef's by providing critical data related to shelf-stability of a new product line through temperature, color, texture and microflora analysis.

With this, Chef's then made the

necessary formulation adjustments to produce an outstanding quality product.

Chef's plans to unveil the new product line very soon, so consumers should look for it in retail stores.



Chef's Requested Foods truck being loaded with product at the Oklahoma City facility for distribution.

Wheat Quality Evaluation

The Oklahoma Wheat Commission is celebrating Oklahoma wheat market expansion.

In June, the OWC brought a trade team of Mexican millers to Oklahoma to learn about the value and quality of Oklahoma hard red winter wheat.

Patricia Rayas, FAPC cereal chemist, performed milling and baking evaluations on wheat samples from various Oklahoma elevators to have wheat quality test data available for October's Association of Latin American Industrial Mills conference in Cancun,

Mexico.

Providing the analysis of key quality characteristics of Oklahoma wheat to potential buyers is in itself adding value because it increases buyer confidence in the grain they purchase for manufacturing flour.

These efforts paid off in mid-January as 25 railroad-car loads (85,000 bushels) of Oklahoma wheat were sold directly to a flour miller in Mexico City from Wheeler Brothers Grain Company in Watonga.

This direct purchase could be the dawning of a new era in wheat sales for elevators across the state, shifting the production focus to quality. By knowing more about what the buyer wants, elevators can sort the grain they receive to meet the needs of the buyer, and possibly pay a premium for grain meeting those requirements.

This opportunity also gives producers the ability to market their wheat without the possibility of it being mixed with dockage or lower-quality grain, thus allowing Oklahoma farmers to bring home a better price for their wheat and also create a greater demand for the high quality crop.

Pictured at the Wheeler Bros. rail factory from left to right: Bart Brorsen, OWC chairman; Paul Jackson, OWC commissioner; Scott Dvorak, OK Farm Bureau director; Gary Gilbert, OWC executive director; Henry Jo Von Tungeln, OWC commissioner; Patricia Rayas, FAPC Cereal Chemist; and Mike Mahoney, Wheeler Bros. executive vice president.



Process Engineering

Sometimes, life just goes to the dogs. However, FAPC has helped make that a good thing.

John and Anne Niwa, owners and operators of Granny's Hillside Farms in Gore, Okla., contacted the center to develop a line of nutri-

tional, all-natural pet foods and treats, an idea stemming from their small, pet turtle business.

Tim Bowser, FAPC food process engineer, worked with the Niwas to develop several successful recipes and processes for turtle,

iguana and tortoise food and Bon Bon dog treats.

Food Research Initiative Program (FRIP) and Oklahoma Center for the Advancement of Science and Technology (OCAST) dollars funded the projects.

These new, commercially marketed products are manufactured in a new production facility in Gore.

This project also promoted the priority areas of animal nutrition, food processing and economics.

In the past year, advances in the production process have allowed an upgrade from 12 to 100 dozen animal treats per minute.

The pet foods and treats are marketed in specialty pet stores and in Laid Back Enterprises, Inc., a catalog based out of Oklahoma City.

John and Anne Niwa help Tim Bowser inspect young turtles for their progress. The Niwas, owners of Granny's Hillside Farms, first worked with the FAPC to develop turtle food before expanding to canine treats.



FRIP dollars also funded the development of a novel meat grinder (cutter-separator).

The grinder was built in the mechanical shop of the Biosystems and Agricultural Engineering Department and evaluated in the center.

The unit processed meat chunks as data on product temperature, power requirements and throughput data were collected.

Approximately 45 percent of all beef is sold as some form of ground beef, and grinders also are used extensively in many fresh and processed pork and poultry operations.

Many low-cost sources of meat presently are not considered suitable for grinding because of excessive connective tissue and bone. The novel grinder may remove these unwanted components.

The grinder is expected to generate a great deal of interest and support from the meat packing industry, equipment suppliers and manufacturers of grinding machinery.

Possible alternative uses for the grinder may include meat tenderizing or the development of new meat-based products since the texture of the ground product is improved significantly.

Possibilities also exist for processing other agricultural materials, such as vegetables and fruits where seed removal is preferred.



Pictured is the complete grinder with a close-up of the spring cutter mechanism in operation.

C.J. Nutracon, Inc., a soup-stock manufacturer in Guymon, Okla., sought the assistance of the center for both the appraisal of their production equipment and shelf-stability of their products.

The company originally began in Korea, then moved into the United States with offices in New Jersey. Continued success and expansion led to the building of the manufacturing plant in Guymon.

C.J. sought FAPC assistance after redesigning their process, incorporating U.S. equipment to allow for process scale-up.

This scale-up and change in equipment caused a problem of product instability, resulting in a product that did not meet C.J.'s specifications.

FAPC staff (Chuck Willoughby, business; Brian Shofran, chemistry; and Tim Bowser, food engineering) examined methods of producing the soup stock as a stable emulsion, a requirement for marketing the product.

Center specialists began re-researching the product, equipment and process in the fall of 1998.

Bowser identified and recommended economical and efficient equipment and process changes, which led to additional product shelf-stability research. By spring 1999, the company was in production and continues its growth today.

The soup-stock currently is refrigerated and transported to Korea and other markets. Bowser currently is assisting C.J. by develop-

ing an economical and safe process for storage without refrigeration.



C.J. Nutracon plant, Guymon, Okla.

Food Engineering

Nearly half of the total food use for peanuts is accounted for in peanut butter. However, this mainstay lacks the convenience of other ready-to-eat products such as cheese slices.

OSU scientists from the departments of Biosystems and Agricul-

tural Engineering, Horticulture and Landscape Architecture and the Food and Agricultural Products Center have developed individually wrapped peanut butter slices, thanks to funding from the Oklahoma Peanut Commission and the FAPC Food Research Initiative Program (FRIP).

Danielle Bellmer, FAPC food engineer, has been working on the project, refining the formulation to match the textural properties of peanut butter, yet retaining shelf-stability and easy wrapper removal.

Successful test runs of the slices have been conducted in

cooperation with American Dairy Brands, a cheese processing company in Plymouth, Wis.

The next step in development will include an evaluation of packaging materials to be used for the slices. These tests will involve both further pilot-processing and extended shelf-life testing.

OSU's Office of Intellectual Properties and Technology Transfer is helping to find a buyer for this new technology. So far, there are three major companies interested in the rights for commercializing the product, with the center's priority for the product to be manufactured in Oklahoma using Oklahoma-grown peanuts.



Microbiology

Unitherm Food Systems (Ponca City, Okla.), an Oklahoma food processing equipment manufacturer, together with Peter Muriana, FAPC food microbiologist, are advancing efforts in food safety by conducting research on process parameters for microbial reduction using Unitherm's steam-injected, post-packaging pasteurization system.

Muriana's work evaluates the effectiveness of Unitherm's process on reduction of *Listeria monocytogenes*, a dangerous food-borne pathogen that sometimes contaminates meat-processing environments.

Although not currently required, a post-package pasteurization helps to provide a greater level of safety to ready-to-eat deli meat products.

The approximately two-minute process can provide a 100 to 1,000 fold reduction of *Listeria* in the products.

This research can be done because of the FAPC's Pathogen Processing Lab, a pilot plant facility dedicated to working with pathogen-inoculated products (pathogen-inoculated test products are not allowed in traditional pilot plant facilities where edible foods are

processed).

Muriana has worked with several of Unitherm's potential clients to conduct research on process parameters to validate claims of the equipment's capability to signifi-

cantly reduce *Listeria*. This has allowed the center to foster direct relationships and pursue further studies with potential clients, such as Cargill, BillMar, Foster Farms and Perdue Farms.



*FAPC microbiologist, Peter Muriana, uses Unitherm's process to evaluate the effects of post-package pasteurization on *Listeria monocytogenes* inoculated turkey product.*

Photo by Todd Johnson

Industry Advisory Committee

Appointments by the Governor

Virgil Jurgensmeyer
J & M Farms
1920 Seventh Avenue, NE
Miami, Okla. 74354
Term: July 1997-June 2000

Don Ramsey
Blue & Gold Sausage
P.O. Box 657
Jones, Okla. 73049
Term: July 1999-June 2002

Dean Smith
Fruit and Vegetable Producer
Rt. 2 Box 178
Hydro, Okla. 73048
Term: July 1999-June 2002

Michael L. Wright
Hormel Foods
Rt. 1 Box 154A
Minco, Okla. 73059
Term: July 1999-June 2002

Appointments by the Senate Pro Tempore

James L. Cochran
Pfizer Animal Health
2502 Acacia Court
Norman, Okla. 73072
Term: July 1999-June 2002

Gary Crane
Ralph's Packing Company
P.O. Box 249
Perkins, Okla. 74059
Term: July 1998-June 2001

Rodger T. Kerr
Economic Development
18 Constitution Ave.
Altus, Okla. 73521
Term: July 1998-June 2001

David McLaughlin
Advance Food Company
13800 Wireless Way
Oklahoma City, Okla. 73134
Term: July 1997-June 2000

Appointments by the Speaker of the House

Brett Burk
ELANCO Animal Health
60 East 15th, PMB #221
Edmond, Okla. 73013
Term: July 1999-June 2002

Ron Jamison
Tahlequah Mill and Elevator Company
612 West Keetoowah
Tahlequah, Okla. 74464
Term: July 1997-June 2000

Bobby Miller
Miller Truck Lines
P.O. Box 665
Stroud, Okla. 74079
Term: July 1999-June 2002

Linda Whitworth
Textiles
1225 North 14th
Frederick, Okla. 73542
Term: July 1999-June 2002

Appointments by the Dean and Director- DASNR, OSU

Robert Bingham
Bil-Jac Foods
8620 Regency Drive
Tulsa, Okla. 74131
Term: July 1999-June 2002

Roger Ediger
Ediger and Ediger Farms
Rt. 2 Box 195
Enid, Okla. 73703
Term: July 1998-June 2001

Charles Nichols
Producer/Cattleman
Rt. 2 Box 15-D
Arnett, Okla. 73832
Term: July 1998-June 2001

The OSU Value-Added Faculty and Staff

The faculty and staff of Oklahoma State University that have research and (or) extension programs directly related to value-added processing of agricultural products are listed below by department, college and (or) campus.

Food and Agricultural Products Center

Bellmer, Danielle- Engineering
Bowser, Tim- Engineering
Brooks, Jim- Business and Marketing
Gilliland, Stanley- Microbiology
Holcomb, Rodney- Economics
Johnson, Rachel- Administration
Liu, Linsen- Oilseed Chemistry
McGlynn, William- Horticultural Food Science
McKee, Frank- Total Quality Management
Muriana, Peter- Microbiology
Moe, David- Processing
Nelson, Jacob- Meat Processing
Rayas-Duarte, Patricia- Cereal Science
Reilly, Siobhan- Microbiology
Roduner, Richard- Analytical Chemistry
Satterlee, Lowell- Administration- Chemistry
Scott, Darren- Food Science/ Sensory
Stone, Corey- Business and Marketing
Willoughby, Chuck- Business and Marketing

Agricultural Economics

Anderson, Kim
Henneberry, Shida
Lyford, Conrad
Peel, Derrell
Schatzer, Joe
Schreiner, Dean
Tilley, Dan
Trapp, Jim

Ward, Clement
Woods, Mike

Agronomy

Carver, Brett

Animal Science

Berry, Joe
Dewitt, Christina
Morgan, Brad
Ray, Fred

Biochemistry and Molecular

Biology

Waller, George
Cushman, John

Biosystems and Agricultural

Engineering

Brusewitz, Gerald
Hamilton, Doug
Noyes, Ronald

Entomology

Bonjour, Edmond
Phillips, Thomas

Forestry

Hiziroglu, Salim

Home Based and Micro Business

Center- College HES

Muske, Glenn

Horticulture and Landscape

Architecture

Anderson, Jeff
Maness, Niels
McCraw, Dean

Nutritional Sciences

Hines, Margaret
Stoecker, Barbara

Oklahoma State University- Oklahoma City Campus

Cruz-Rodz, Armando- chemistry
Nielsen, Jerry- microbiology

Psychology- Arts & Sciences College

Abramson, Charles

Wes Watkins Agricultural Research and Extension Center

Edelson, Jonathan- plant pathology/entomology
Shrefler, James- horticulture
Taylor, Merritt- economics

Veterinary College

Sangiah, Subbiah- toxicology

Food Research Initiative Program, 1998-1999

The following bullets are of Food Research Initiative Program (FRIP) project titles. The program serves as a source of funding for social, biological and physical scientists to discover, through focused basic and applied research, solutions to problems and needs that arise with Oklahoma's agricultural product processors.

- Evaluation and enhancement of educational programs presented by the Oklahoma Food and Agricultural Products Research and Technology Center
- Factors affecting agribusiness firm locations in Oklahoma
- Continuing development and evaluation of shelf-stable, ready-to-eat food for box turtles
- Development and evaluation of a novel grinder for meats
- Determination of electrical conductivity of foods during Ohmic heating
- Development of an agglomeration and pelletizing process for extraction of ground sage
- High production of natural caffeine from plant cell cultures

FAPC Assisted Start-up Companies, 1997-2000

<u>Company</u>	<u>Principal</u>	<u>Location</u>
Backwoods Basket	Danielle Coursey	Tahlequah
Beaver Creek Farms	Carole Brown	Lawton
Belleville Salsa	Danny Belleville	McAlester
Berryhill Candies	Marsha Berryhill	Tulsa
Big Daddie's BBQ Sauce	Jim Leach	OKC
Bill's Kitchen BBQ Sauce	Bill Bonny	Woodward
Billy Boy Bar-B-Q Sauce	Dana Scott	Shawnee
Brown's Simple Syrup	Rebecca Brown	Tulsa
Bulldog Beef Jerky	Jerry Josefy	Grandfield
C.J. Nutracon	H.K. Lee	Guymon
Central Springs Water	Dave Roberson	Seminole
Christian Cheese Company	George Christian	Kingfisher
Cole's Honey	James Cole	Lexington
Custino's Supreme Quality Food Products	Phil Custino	OKC
Dacoma Business Incubator		Dacoma
Dan's Cornbread Stuffing	Dan Brown	Warr Acres
D-Water Solutions	Gary Roach	Midwest City
Foster's Famous BBQ	Troy Harrod	OKC
Gooley Gourmet	Dennis McKilligan	Guymon
Gourmet-on-the-Go	Lynn Martin	Tulsa
Granny's Hillside Farms	John & Anne Niwa	Tenkiller
Have You Heard Milling	Levi Heard	OKC
Huckins' Beef Jerky	Lynn Huckins	Medicine Park
Iatridis, Andrew	Andrew Iatridis	Tulsa
KAJLB Frozen Foods	Doyle Beck	Shawnee
Knight Creek Farms	Bob & Bill Knight	Sapulpa

FAPC Assisted Start-up Companies, cont.

<u>Company</u>	<u>Principal</u>	<u>Location</u>
Lucky Dog Trading Company	Jennifer Sterling	Tulsa
Mabe Baby BBQ Sauce	Ray Mabe	Hulbert
Mama Ester's Fruit Salad Dressing	LaWana Garrett	Ardmore
Martin Luther King Center	Reverend Carl Loftis	Ardmore
Mountain Mama's Salad Dressing and Wine Sauce	Mary Bogue	Disney
Mrs. Farmer's Recipe Collection	Donna Farmer	Mannford
My Dad's Salsa	Douglas and Vicki Bortnem	Tulsa
Oklahoma Bad Lands	Ken Ritchie	Broken Arrow
Oklahoma Red BBQ	Charles Harber	Seminole
Our Enterprises (Pesto Sauces)	Pam Chase	OKC
Paragon Specialties BBQ Sauce	Kim Mitchel	Claremore
Peppas Foods Company	Jim Ard	Weatherford
Red Bud Gourmet	Doug and Sandra Williams	Perkins , Bristow
Renegade Salsa	Flick Cooper	OKC
Richardson Foods	Dallas Richardson	OKC
Rite Ranch Beef	Ken Miller	Shattuck
Rush To Judgement Sauces	Mary Rush	Sapulpa
Sister's Plum	Paula McLeroy	Blanchard
Star Dairy	Don Tucker	Mulhall
Stormer, Steve	Steve Stormer	Vinita
The Butcher Shop	Desiree Howell	Clinton
The Soup Lady	Dee McGee	Tuttle
Uncle Max's Fudge	Wayne Boan	Jenks
Wanda Jo's BBQ Sauce	Jimmy Hughart	Catoosa
Wellness Works	Ed and Ann Stone	Tulsa

Active FAPC Projects, 1999-2000

<u>Company</u>	<u>Contact</u>	<u>Location</u>
A Wing and A Prayer Quail Farm	Allen and Tammy Jobs	Coyle
Advance Foods Co.	R.D. Justus	Enid
Advance Foods Co.	Jim Walker	OKC
Bachman, Susan	Susan Bachman	Deer Creek
Backwoods Baskets Inc.	Danielle Coursey	Tahlequah
Baking Release	Diana Byer	Tulsa
Balchem Corporation	Winston Samuels	Slate Hill, NY
Cherokee Locker Plant	Alvin Kreiman	Cherokee
CJ NutraCon	HK Lee	Guymon
Cody's Real Pet Food Products	Bob Jandebour	Tulsa
Custinos Supreme Quality Food Products	Phil Custino	OKC
Dennis, Larnell	Larnell Dennis	OKC
Dorothy Faye Inc.	Delbert Spriggs	OKC
D-Water Solutions	Gary Roach	Midwest City

Active FAPC Projects, cont.

El Sueno Enterprises	Richard Ortez	Glencoe
G & R Foods	Clay Borchers	Reedsburg, WI
General Mills	Nadja Glasenapp	Minneapolis, MN
Halal Project	Alex Williams or Husan Muhammed	Tulsa
Hanson Cold Storage	Mike Powers	Logansport, IN
Harris, Dell	Dell Harris	Lawton
Jeffrey Stephen	Stephen Jeffrey	Okarche
Johnston Enterprise	Lew Meibergen	Enid
Johnston Seed Co.	Herman Dittrich	Enid
Joseph, Mary	Mary Joseph	Yukon
Kelco (Nutrasweet)	John Flakive	Okmulgee
Knight Creek Farms	Bill Knight	Tulsa
Laid Back Enterprises	Tracy Caldwell	OKC
Manila Foods	Ken Wilkey	Blackwell
Martin Luther King Center	Reverend Carl Loftis	Ardmore
Metabetz Foods	Emetta Jennings	OKC
Michael's Gourmet Products	Michael Smith	Tulsa
Mid OK Cooperative	Ed Smith	Okarche
Mynor Ingredients	Rabia Khazi	Tulsa
Nomadics, Inc.	Bob Hilley	Stillwater
OK Water	Tom Rayburn	Stillwater
Oklahoma Wheat Commission	Gary Gilbert	OKC
Osteen's Meats	Dewayne Smith	
Pet Chauffeur and Nanny	Connie Barnett	Ponca City
Pittman, Jim	Jim Pittman	Davis
Pratt Foods	Larry Harris	Shawnee
QFSE Inc. OK Restaurant Supply	David Hennessy	Wellston
Richardson Foods	Dallas Richardson	Yukon
Rock Ridge Rabbitry	Larry Longan	Perry
Savadon, Grant	Grant Savadon	Sapulpa
Shawnee Milling Co.	Samuel Garlow	Shawnee
Shelly Short Bars	Shelly Short	Norman
Sunrise Dairy	Ron Overstreet	Boise City
Sweis Brothers Inc.	Joel Sweis	OKC
The Bama Companies, Inc	Eric Jackson	Tulsa
Triple H Ranch	Joe Horton	Frederick
Unitherm Food Systems	David Howard	Ponca City
W. B. Johnston Grain	Butch Meibergen and Troy Rigel	Enid
Wellness Works	Ed Stone	Tulsa
Win Hy Foods	Robert Bingham	Tulsa
Woody Candy Company	Claude Woody	OKC

Completed FAPC Projects, 1999-2000

<u>Company</u>	<u>Contact</u>	<u>Location</u>
Ada Candy Co.	Jack Bullard	Ada
Advance Foods Co.	Tom Harpenau	Enid
Bar-S Foods Co.	Robert Uhl	Phoenix, AZ
Bartunek Winery	Robert Bartunek	Enid
BBQ By Himes	Artis Himes	Tulsa
Bell Flavors and Fragrances	Robert Miltner	Kentfield, CA
Belleville Salsa	Denny Bellville	McAlester
Berryhill Candies	Marsha Berryhill	Tulsa
Biaggi, Tera	Tera Biaggi	Ponca City
Bill's Kitchen and Catering	Bill and Chris Bonny	Woodward
BS Jerky	Monty Sisemore	Rush Springs
Bulldog Beef Jerky	Jerry Josefy	Grandfield
Central Spring Waters, Inc.	Dave Roberson	Seminole
Chambers, Charley	Charley Chambers	Pawhuska
Chef's Requested	Gary Whetstone or John Williams	OKC
Chicken Helper	Garland Brown	Tulsa
Christian Cheese	George Christian	Kingfisher
C.J. Nutracon	Peter Ha	Guymon
Concho Farms	Scott Burgett	Concho
Cook Shack	John Shiflet	Ponca City
Custino's Supreme Quality Food Products	Phil Custino	OKC
DeWayne's BBQ Sauce and Catering	DeWayne Muret	Newkirk
Elizabeth Maurer	Elizabeth Maurer	Ponca City
Emu Products and Management	Brian Stewart	Marlow
FAPCMeat HACCP	David Moe	Stillwater
Farmer's Elevator Cooperative	Howard Deplane	Ames
Farmer's Grain Co.	Mike Frickenschmidt	Enid
Field's Pies	Chris Fields	Pauls Valley
Ford, Monica	Monica Ford	Tulsa
Francisco, Teresa	Teresa Francisco	OKC
Good Fun Foods	Jack Lyons	OKC
Gosney, Troy	Troy Gosney	Woodward
Granny's Herbs	Sharon Messner	Porter
Horn of Plenty Produce	Carol Hornback	Checotah
How Sweet It Is	Al Pheiffer	Meeker
Huckins, Lynn	Lynn Huckins	Medicine Park
Imperial Coffee and Foodservice	Kevin Gordon	Tulsa
Indian Springs Natural Spring Water	Jean Craige	Hendrix
Ironhead Salsa	Flick Cooper	Moore
Jackie Brannon Correctional Center	Cody Mitchell	McAlester
Jethro's Jerky	Chris Emerson	Kiefer
J-M Foods	Terry Jurgensmeyer	Miami
Jones Packing Co.	F. Lavern Glenn	Madill
Kaiser Beverage Company	Larry Burke	OKC
KAJLB Frozen Foods	Doyle Beck	Shawnee
Karpis, Nick	Nick Karpis	Milburn

Completed FAPC Projects, cont.

<u>Company</u>	<u>Contact</u>	<u>Location</u>
Katy's Enterprises	Warren Rieger	Enid
Kelly Farms	Charles Kelly	Broken Arrow
Latridis, Andrew	Andrew Latridis	Tulsa
Mabe Baby BBQ Sauce	Ray Mabe	Hulbert
Maria Ray Salsa	Mary Buthman	Enid
Maridee's Country Kitchen	Mary Lou Munn	Elmore
Martin Luther King Center	Reverend Car Loftis	Ardmore
McKilligan, Dennis	Dennis McKilligan	Guymon
Micro-Grain Inc.	Steven Halverson	Clinton
Mynor Ingredients	Rabia Khazi	Tulsa
No Man's Land Beef Jerky	Britt Smith	Boise City
Nomadics, Inc.	Joe Dowlen	Stillwater
Nonion LLC	Chris Cooley	Broken Arrow
Nuttie, Marc	Marc Nuttie	Norman
OK Extended Life Foods	Bob Carlon	Shawnee
Old 300 LLC	Jack Wright	Purcell
Oly, Tom	Tom Oly	Claremore
Our Enterprises, L.L.C.	Pam Chase	OKC
Pearson, Ron	Ron Pearson	Roland
Pepper Jo's	Jovita Black	Lone Grove
Production Specialties Inc.	Ken Stamper	Ardmore
Quincy's Country Sausage	Quincy Morris	Agra
Ranchers For Life Coop	Pat Cheek	Bristow
Richardson Foods	Dallas Richardson	Yukon
Rite Ranch	Ken Miller	Shattuck
Rush to Judgement Sauces	Mary Rush	Sapulpa
Savage, Amanda	Amanda Savage	Stratford
SC and Dreams	Bridgette Hodge	Tecumseh
Seaboard Farms, Inc.	Ben Wheeler	Guymon
Shawnee Milling Co.	Gary Lorenz	Shawnee
Smolen, Don	Don Smolen	Tulsa
Solutia, Inc.	Dana Saylor	St. Louis, MO
Southern OK Technology Center	J.W. Reese	Ardmore
Stan Clark Companies	Robert Williams	Stillwater
Sugar Baker's Halo Cookies	Sandra Barr	Fresno, CA
The Sausage Factory LTD	Raymond Bayer	Tulsa
Tulsa Beef and Provision Inc.	David Heat	Tulsa
Uncle Max's Famous Fudge	Wayne Boan	Jenks
Unitherm Food Systems	David Howard	Ponca City
USA Bottling	Jerry Keirn	Ponca City
Value Added Partners LLC	Mike Payne	Alva
Van Winkle, Joseph	Joseph Van Winkle	OKC
Walter Tender Lean Natural Beef	Nancy Walter	Tulsa
Wheatland Foods	Jerry Laerade	Hays, KS
Wheeler Brothers	Mike Mahony	Watonga
Willy's Hamburgers	Jessica Wilson	Harrah