

State of the Department of Grain Science & Industry and Our Current Priorities

Dr. Dirk E. Maier
Professor and Head



Vision for K-State's Grain Science & Industry Department

The global education, research and technology transfer leader for the grain & plant-based food, feed, fiber, fuel and bio-products supply chains."



Mission of K-State's Grain Science & Industry Department

"To educate students and professionals, conduct innovative research, transfer new technologies and knowledge, offer high-quality outreach programs and services to meet the needs of the global grain & plant-based food, feed, fiber, fuel and bio-products supply chains."



Initial Priorities

- **Grow our student enrollment**
- **Grow our research enterprise**
- **Grow our outreach efforts**



Key Facts

- Faculty & Staff
 - 14 tenure track, 5 non-tenure track faculty; 16 adjunct
 - 22 professional staff; 11 classified staff
- Students
 - 180+ undergraduate students in 3 BS programs
 - 45+ graduate students in MS and PhD programs
- Facilities – mix of outdated and state-of-the-art
- Budget – Annual ~\$5 mill; Extramural >\$2.5 mill
- Alumni – Over 4,000 world wide
- Founding – 100-year anniversary in 2010



Initial Priorities

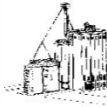
- Grow our outreach efforts
 - need to expand service activities
 - Wheat Quality Lab is a state, regional and national resource
 - Grain & Feed Microbiology & Toxicology Lab
 - Protein Lab, Flour & Dough Lab, Biomaterials Lab,
 - need to expand short course offerings
 - traditional IGP and NEW domestic opportunities
 - 2009: 24 short courses with 460 participants
 - need to initiate distance learning programs
 - GEAPS, AFIA, IAOM, AACCC, ...
 - 8 courses, 17 offers, 600 students, 17 countries

Kansas Wheat Quality Lab



Supported by the Kansas Wheat Commission

AFIA-KSU Feed Manufacturing Short Courses



Principles of Feed Manufacturing Short Course June 10-13, 2008

Presented by Kansas State University, the American Feed Industry Association and the National Grain and Feed Association

Background

The Department of Grain Science and Industry at Kansas State University has held Feed Manufacturing Short Courses since 1976. These courses are taught by a unique blend of individuals from Kansas State University and within the feed industry and provide in-depth training on all aspects associated with feed manufacturing.

Who Should Attend

This course provides participants with a comprehensive understanding of feed manufacturing. It targets individuals relatively new to the feed industry and/or associated with an allied industry.

Location and Registration Information

The course will be held in Manhattan, Kansas, at the Department of Grain Science and Industry at KSU. Travel information will be provided upon registration. The registration fee for this course is \$950. This includes a copy of *Feed Manufacturing Technology V*, short course handout materials, all breakfasts, lunches, breaks and one dinner.

For registration information, contact:

Leland McKinney, Program Coordinator
Dept. of Grain Science & Industry
Kansas State University
201 Sheltenberger Hall
Manhattan KS 66506-2201
Phone: 785-532-4080
E-mail: lelandm@ksu.edu

Hotel Accommodations

Room block available until May 11, 2008, at:
Holiday Inn At The Campus
1641 Anderson Avenue
Manhattan, KS 66502
Phone: 785-539-7531
Fax: 785-539-3909
www.holidayinn.com/universities

Mention that you are attending the K-State Feed Manufacturing Short Course to receive a reduced rate.

Additional Information

JUNE 2nd IS THE LAST DAY TO REGISTER. Class size is limited so register early. The course is subject to cancellation if there are less than 15 enrollments. Kansas State University is dedicated to making short courses accessible to all persons. To increase our ability to assist you in finding necessary services or if you have a dietary preference, please indicate this when registering.

Schedule

June 10th - Starting at 5:00 pm

- Registration
- Dinner
- An Overview of the Feed Industry

June 11th - 7:30 am to 5:30 pm

- Review of Animal Nutrition
- Feed Processing Flow
- Equipment Types and Selection
- Feed Mill Design
- Receiving & Quality Control
- Sanitation & Pest Management
- Work Place Safety

June 12th - 7:30 am to 5:30 pm

- Particle Size Reduction
- Weighing & Proportioning
- Mixers & Mixer Performance
- Preventative Maintenance

June 13th - 7:30 am to 11:30 am

- Principles of Steam Generation and Conditioning
- Fundamentals of Pelleting
- Pellet Cooling and Post-Pellet Liquid Application



ADVANCED FEED MILL MANAGEMENT April 8-11, 2008 Kansas State University Feed Manufacturing Short Course

Presented in cooperation with the American Feed Industry Association, the National Grain and Feed Association, and the International Grains Program

Background

The Department of Grain Science and Industry at Kansas State University has held Feed Manufacturing Short Courses since 1976. These courses are taught by a unique blend of individuals from Kansas State University and within the feed industry and provide in-depth training on all aspects associated with feed manufacturing.

Who Should Attend

This course is designed for feed mill supervisors, managers and individuals from allied industries who wish to sharpen their management skills.

Location and Registration Information

The course will be held in Kansas City, Missouri, near the Kansas City International Airport (MCI). The registration fee for this course is \$750. This includes short course handout materials, all lunches, break refreshments, and one dinner. *Feed Manufacturing Technology V* will be available for purchase at a reduced rate.

For registration information, contact:

Anita McDiffett
Dept. of Grain Science & Industry
Kansas State University
201 Sheltenberger Hall
Manhattan KS 66506-2201
Phone: 785-532-4080
E-mail: anitam@ksu.edu

Hotel Accommodations and Short Course Location

Room block reserved until **March 3, 2008** at:
Fairfield Inn by Marriott Kansas City Airport
1820 NW Plaza Circle
Kansas City, Missouri 64153
Phone: 816-464-2424
Fax: 816-464-2361

Mention that you are with the KSU Feed Mill Management Short Course to receive a reduced room rate.

Additional Information

Class size is limited so register early. The course is subject to cancellation if there are less than 15 enrollments. Kansas State University is dedicated to making short courses accessible to all persons. To increase our ability to assist you in finding necessary services or if you have a dietary preference, please indicate this when registering.

Schedule

April 8th - Starting at 5:00 pm

- Registration
- Being an Effective Leader
- Overview of the Feed Industry

April 9th - 8:00 am to 5:30 pm

- A Manager's Role in Feed Mill Operations
- Regulations Governing the Feed Industry (FDA, OSHA, & EPA)
- Ingredient Purchasing, Logistics and Inventory Control
- Managing Energy Costs
- Working With Your Nutritionist
- Maintenance Management

April 10th - 8:00 am to 5:30 pm

- Quality Control, Product Liabilities and Risk Management
- Equipment and Parts Purchasing
- Hiring Practices
- Motivating and Training Employees
- Sales and Marketing
- Customer Management
- Safe Food/Safe Feed Program

April 11th - 8:00 am to 12:00 pm

- Requirements of ISO
- Emphasizing HACCP in the Feed Mill
- Certificate Presentation

AFIA-KSU Feed Manufacturing Distance Education Program



Advanced Pelleting Concepts July 10-13, 2007

Presented by Kansas State University, the American Feed Industry Association and the National Grain and Feed Association

Background

The Department of Grain Science and Industry at Kansas State University has held Feed Manufacturing Short Courses since 1976. These courses are taught by a unique blend of individuals from Kansas State University and within the feed industry and provide in-depth training on all aspects associated with feed manufacturing.

Who Should Attend

This course provides an in-depth understanding of all aspects of the pelleting process. It is designed for pellet mill operators and feed mill supervisors and managers.

Location and Registration Information

The course will be held in Manhattan, Kansas, at the Department of Grain Science and Industry at KSU. Travel information will be provided upon registration. The registration fee for this course is \$700. This includes a copy of short course handout materials, all breakfasts, lunches, breaks and one dinner.

For registration information, contact:

Leland McKinney, Program Coordinator
Dept. of Grain Science & Industry
Kansas State University
201 Sheltenberger Hall
Manhattan KS 66506-2201
Phone: 785-532-4080
E-mail: lelandm@ksu.edu

Hotel Accommodations

Room block available until June 22, 2007, at:
Holiday Inn At The Campus
1641 Anderson Avenue
Manhattan, KS 66502
Phone: 785-539-7531
Fax: 785-539-3909
www.holidayinn.com/universities

Mention that you are attending the K-State Feed Manufacturing Short Course to receive a reduced rate.

Additional Information

Class size is limited so register early. The course is subject to cancellation if there are less than 15 enrollments. Kansas State University is dedicated to making short courses accessible to all persons. To increase our ability to assist you in finding necessary services or if you have a dietary preference, please indicate this when registering.

Schedule

July 10th - Starting at 5:00 pm

- Registration
- Dinner
- An Overview of the Feed Industry

July 11th - 8:00 am to 5:30 pm

- Why Pellet Feed
- The Pelleting Process: Past, Present, and Future
- Pelleting System Design & Equipment
- Pellet Roll and Die Design
- Pellet Mill Maintenance
- Factors Influencing Pelleting Production Rate and Pellet Quality
- Pelleting Characteristics of Feed Ingredients

July 12th - 8:00 am to 5:30 pm

- Mash Conditioning
- Pellet Cooling
- Boiler Operation
- Boiler Water Treatment
- Steam and Steam Systems

July 13th - 8:00 am to 11:30 am

- Automation of Pelleting Lines
- Crumbling and Post Pellet Liquid Application
- The Cost of Pelleting



FEED MILL MAINTENANCE June 2-5, 2009 Kansas State University Feed Manufacturing Short Course

Presented in cooperation with the American Feed Industry Association, the National Grain and Feed Association, and the International Grains Program

Background

The Department of Grain Science and Industry at Kansas State University, in partnership with industry associations, has held Feed Manufacturing Short Courses since 1976. These courses are taught by a unique blend of individuals from Kansas State University and within the feed and allied industries and provide in-depth training on all aspects associated with feed manufacturing.

Who Should Attend

This course is designed for feed mill maintenance managers, shift supervisors, and feed mill managers.

Location and Registration Information

The course will be held at Kansas State University in Manhattan, Kansas. The registration fee for this course is \$800. This includes short course handout materials, all lunches, refreshments, and one dinner. *Feed Manufacturing Technology V* will be available for purchase at a reduced rate.

For registration information, contact:

Anita McDiffett
Dept. of Grain Science & Industry
Kansas State University
201 Sheltenberger Hall
Manhattan KS 66506-2201
Phone: 785-532-4080
E-mail: anitam@ksu.edu

Hotel Accommodations and Short Course Location

Room block reserved until May 2, 2009, at:
Holiday Inn at the Campus
1641 Anderson Avenue
Manhattan KS 66502
Phone: 785-539-7531
Fax: 785-539-3909

Mention that you are with the KSU Feed Mill Maintenance Short Course to receive a reduced room rate.

Additional Information

Class size is limited so register early. The course is subject to cancellation if there are less than 15 enrollments. Kansas State University is dedicated to making short courses accessible to all persons. To increase our ability to assist you in finding necessary services or if you have a dietary preference, please indicate this when registering.

Tentative Schedule

June 2

- Registration
- Dinner

June 3

- The Importance of Having an Effective Maintenance Program
- Establishing a Preventative Maintenance Program
- Maintenance Safety
- Parts Purchasing and Inventory Management
- Magnets - Design, Testing, and Installation
- Motor Bearing Maintenance

June 4

- Electrical Maintenance
- Dust Filter Maintenance
- Conveyor Maintenance
- Liquid Pump Maintenance
- Maintenance of Compressed Air Systems
- Maintenance of Hammer Mills and Roller Mills
- Batching Systems and Mixer Maintenance

June 5

- Roller and Steam System Maintenance
- Pellet Mill Maintenance
- Pellet Cooler Maintenance

2009 Milling Short Courses

| | Participants | Date |
|-------------------------------|--------------|--------------|
| IAOM-KSU: | | |
| Introduction to Flour Milling | 14 | Jan. 26 – 30 |
| Managing the Milling Process | 10 | Feb. 2 – 6 |
| Mill Processes I | 9 | June 8 – 12 |
| Mill Processes II | 17 | June 15 – 19 |
| <i>Subtotals</i> | 50 | |
| | | |
| Buhler-KSU: | | |
| Soft Wheat Milling | 4 | July 13 – 17 |
| Executive Milling | 14 | July 20 -24 |
| Expert Milling | 6 | August 3 – 7 |
| <i>Subtotals</i> | 24 | |
| | | |
| Totals | 74 | |

GEAPS-KSU Distance Education Program Objective

To organize and provide a professional development curriculum regarding the design and operation of grain handling and processing facilities that meet the seven *GEAPS Core Competencies* and deliver these courses via distance education to grain industry professionals around the globe.



GEAPS-KSU Distance Education Program - Participants

- Participants = 600 from 17 countries
- Individuals = 451
- Organizations = 224
- Companies with most enrolled:
 - CGB = 26
 - Cargill = 23
 - The Andersons = 22
 - Bunge / Bunge Milling = 20
- Most courses completed:
 - Jim Rossman, Kokomo Grain Co = 5

Center for Grain Handling Industry Operations @ K-State

- **Purpose:** The Center for Grain Handling Industry Operations at Kansas State University will serve as the primary partner to the U.S. (North American/ international!?) grain handling industry in providing a current, complementary and comprehensive knowledge resource for the world of grain handling industry operations.
- **Partners:** GEAPS, Grain Handling & Processing Companies, Iowa State University, Purdue University, USDA-ARS GMPRC



Center for Grain Handling Industry Operations @ K-State - Strengths

- Successful GEAPS-KSU Grain & Biorefinery Operations Distance Education Program
- Leadership in new knowledge, technologies and education to the grain industry via its research and outreach programs on grain quality, handling, storage, pest management, facility design, etc
- Grain Elevator Manager short course via IGP
- Planned Certificate in Grain Handling Industry Operations
- Past leadership in grain industry safety particularly dust explosion research and education
- Food Protection and Defense graduate and distance education courses incl Agro Security, Food/Feed Safety
- Successful and existing Master of Agribusiness degree
- Proximity and close working relationship with USDA ARS Grain Marketing & Production Research Center (GMPRC)
- O.H. Kruse Feed Mill and Biorefinery Teaching and Research Center that will include a Grain Handling Facility and KSU's proximity to GMPRC's Grain Elevator & Pilot Bin Facility

Initial Priorities

- Grow our research enterprise
 - need to submit and obtain more grants from external sources
 - compete effectively for larger external grants
 - establish/strengthen strategic partnerships on and off campus
 - incl GMPRC, AIB, and internationally
 - need improved research facilities
 - esp labs and scale up

Award Summary

07/01/08 - 06/30/09 (FY09 All 12 Months)

| | Proposals | | Awards | | | |
|----------------------|-----------|---------------------|-----------|--------------------|-----------------|-------------|
| | Submitted | Total | Received | Total | Average | Yield (%) |
| Plant Path. | 75 | \$10,695,345 | 60 | \$7,607,972 | \$126,799 | 71.1 |
| Agronomy | 105 | \$23,676,698 | 70 | \$4,892,905 | \$69,898 | 20.7 |
| Grain Science | 57 | \$12,691,089 | 36 | \$3,396,240 | \$94,340 | 26.7 |
| Animal Sci. | 40 | \$3,288,874 | 40 | \$1,882,156 | \$47,054 | 57.2 |
| Ag. Econ | 53 | \$7,627,910 | 21 | \$1,350,847 | \$64,326 | 17.7 |
| Entomology | 38 | \$7,509,588 | 30 | \$1,560,774 | \$52,026 | 20.8 |
| Food Science | 2 | \$818,279 | 1 | \$112,657 | - | - |
| Horticulture | 37 | \$5,765,134 | 24 | \$1,082,763 | \$45,115 | 18.8 |
| COA totals | 459 | \$85,749,250 | 327 | \$24,749,049 | \$75,685 | 28.9 |

FY09 Final: \$3,396,240 million

Information from Pre-Awards Services

Grain & Ingredient Storage & Handling

Dr. Leland McKinney

Dr. Subramanyam Bhadriraju

Dr. Dirk Maier



**Identification, Quality, Preservation,
Stored Product Protection, Segregation,
Marketing, Rapid Analysis, Safety &
BioSecurity**



Milling & Extraction



Dr. Jeff Gwartz

Dr. Hulya Dogan

Dr. Ekramul Haque

Prof. Chris Miller

Prof. Huseyin Dogan



**Milling, Component extraction,
Purification, Characterization, Dry-
fractionation**

Baking & Human Nutrition

Dr. Jon Faubion

Dr. Rebecca Miller

Prof. Dave Krishock



Formulation, Ingredients, Flour and
Dough Quality, Process Improvement,
Quality Testing, Prototype Testing



Basic Cereal Chemistry Research



Dr. Yong-Cheng Shi

Dr. David Wetzel

Dr. Ron Madl



**Protein Chemistry, Starch Chemistry,
Characterization, Measurement
Technologies, Ingredients, Product
Development**

Feed & Animal Nutrition

Dr. Keith Behnke

Dr. Leland McKinney

Prof. Fred Fairchild

Dr. Sajid Alavi



**Feed Manufacturing, Ration
Formulation, Extrusion, Petfoods,
Aquafeeds, Process Efficiency,
Grinding, Mixing, Biorefinery Operation**



Biobased Products & Bioenergy

Dr. X. Susan Sun

Dr. Sajid Alavi

Dr. Ron Madl

Dr. Praveen Vadlani



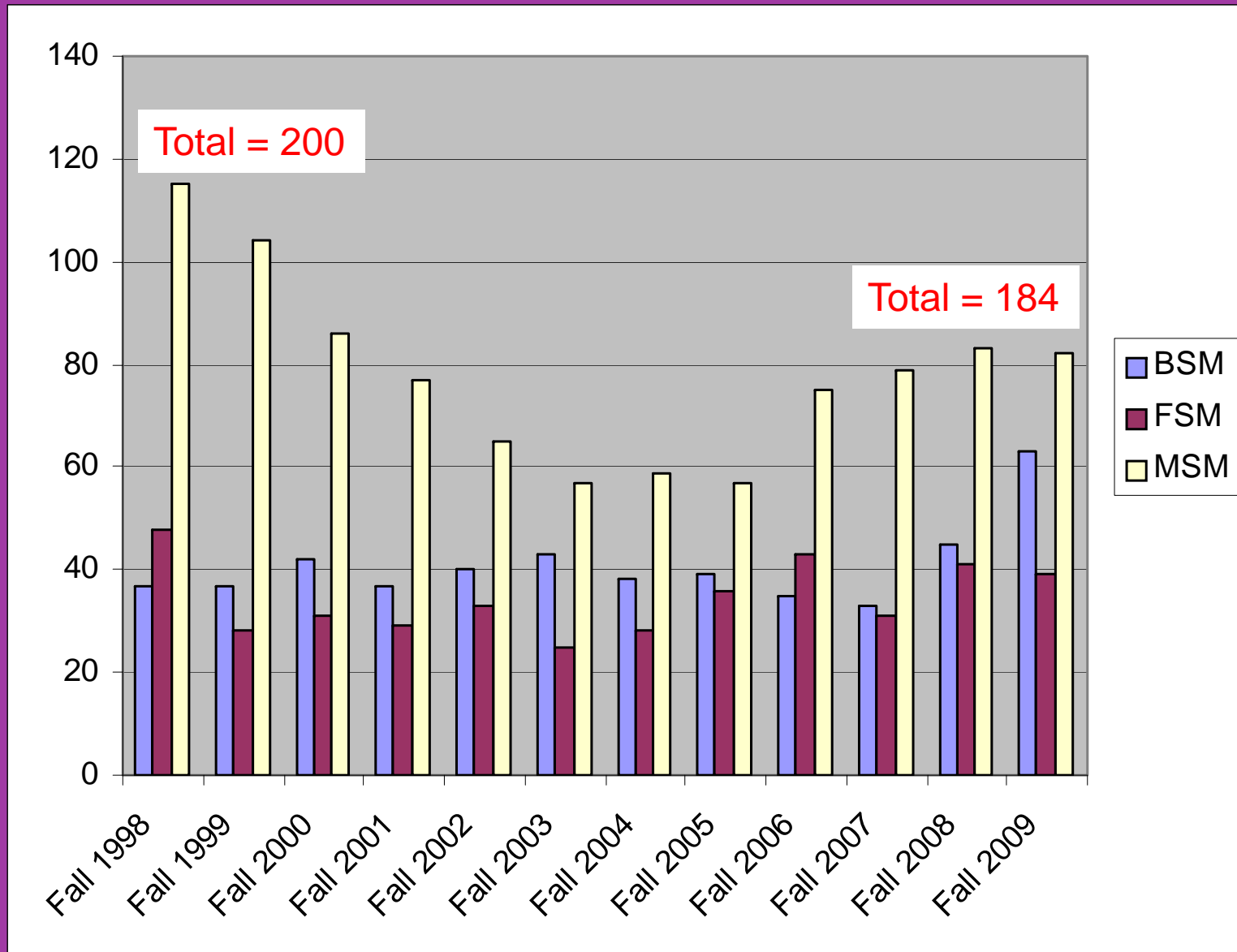
Nonfood Products, Biomaterials,
Biopolymers, Enzymes, Fermentation,
Extrusion, BioEthanol, Formulation &
Prototype Development



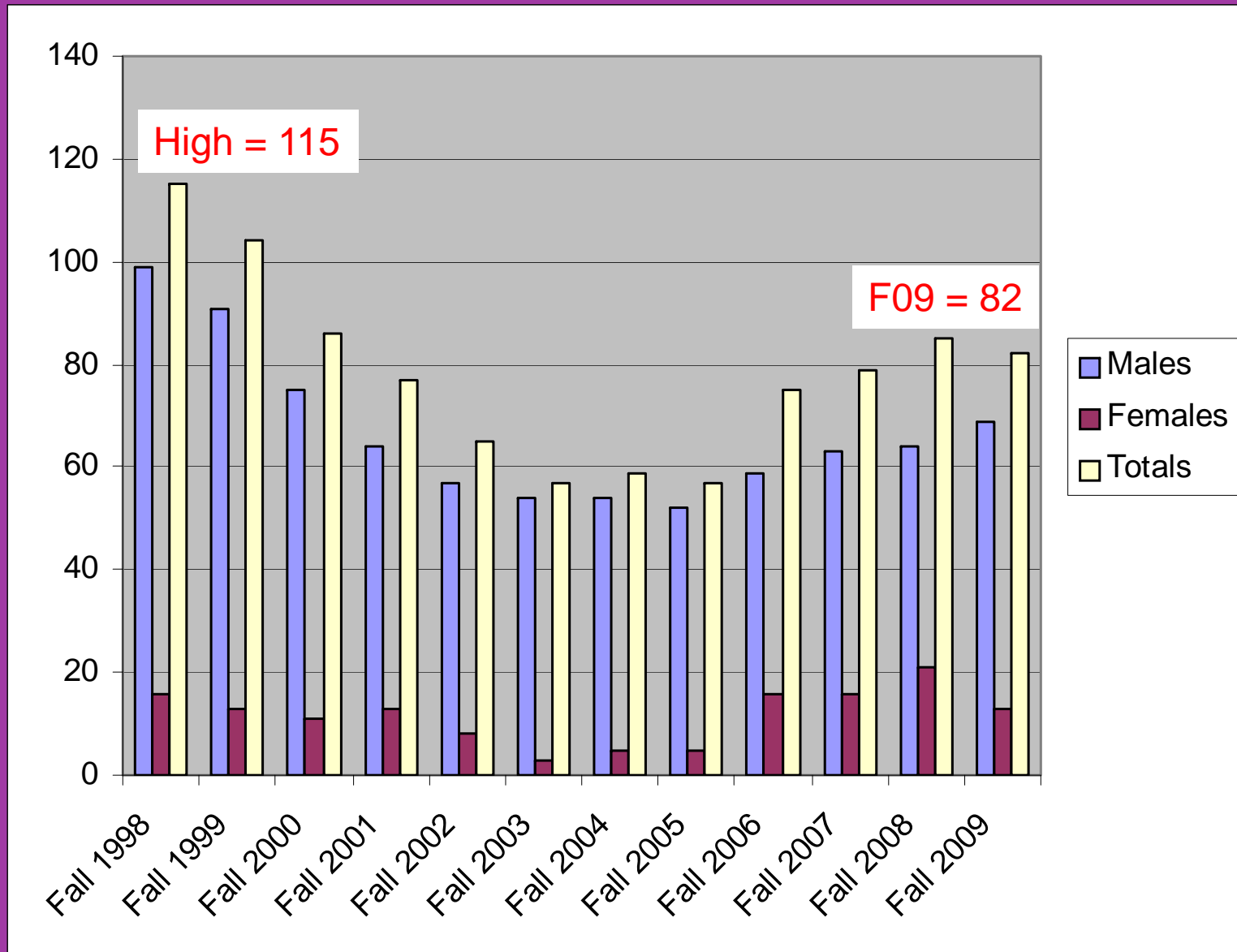
Initial Priorities

- Grow our student enrollment
 - target recruitment of transfer and out-of-state undergraduate students
 - increase scholarship support
 - develop/implement recruitment plan
 - target recruitment of domestic & URM graduate students
 - need competitive stipends and GRA tuition waivers
 - expect excellence; recognize accomplishments
 - compete for NSF and USDA Needs Fellowships
 - need improved teaching facilities for feed, grain, biofuels and baking

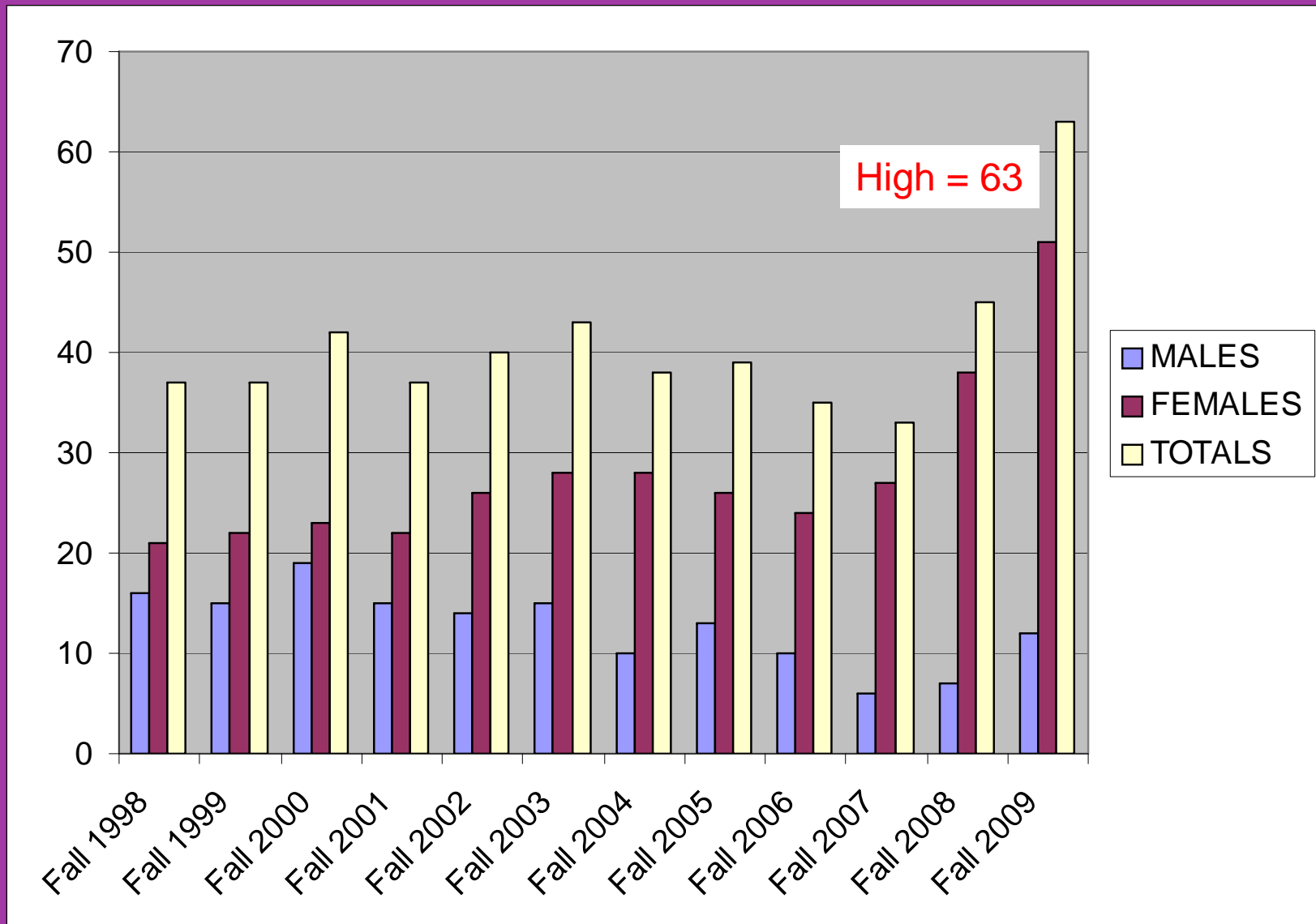
Grain Science Undergraduate Student Enrollment Fall 1998-2009 (Fall'09: 41%F vs 59%M)



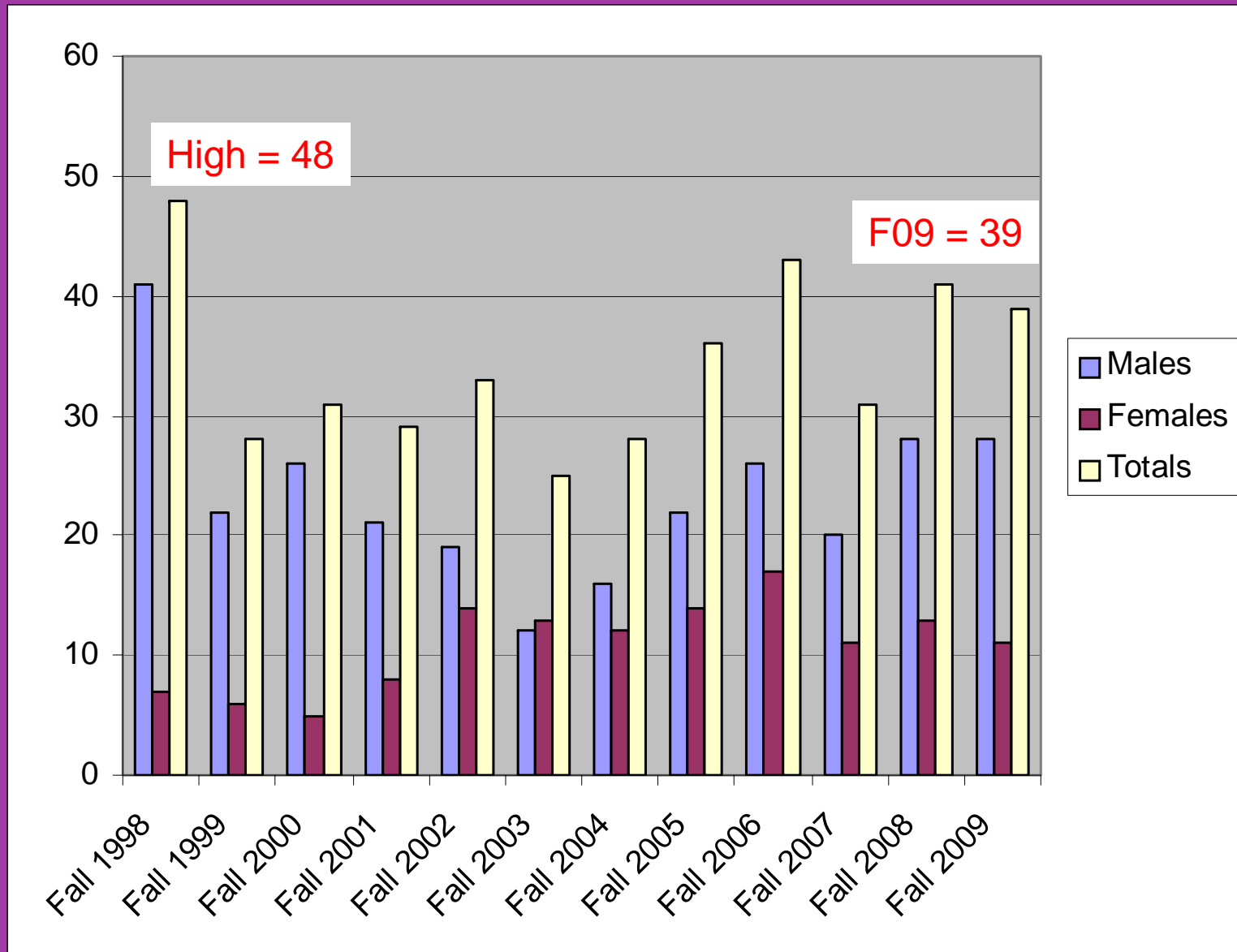
Milling Science and Management Enrollment Sorted by Gender 1998-2009 (Fall'09: 16%F vs 84%M)



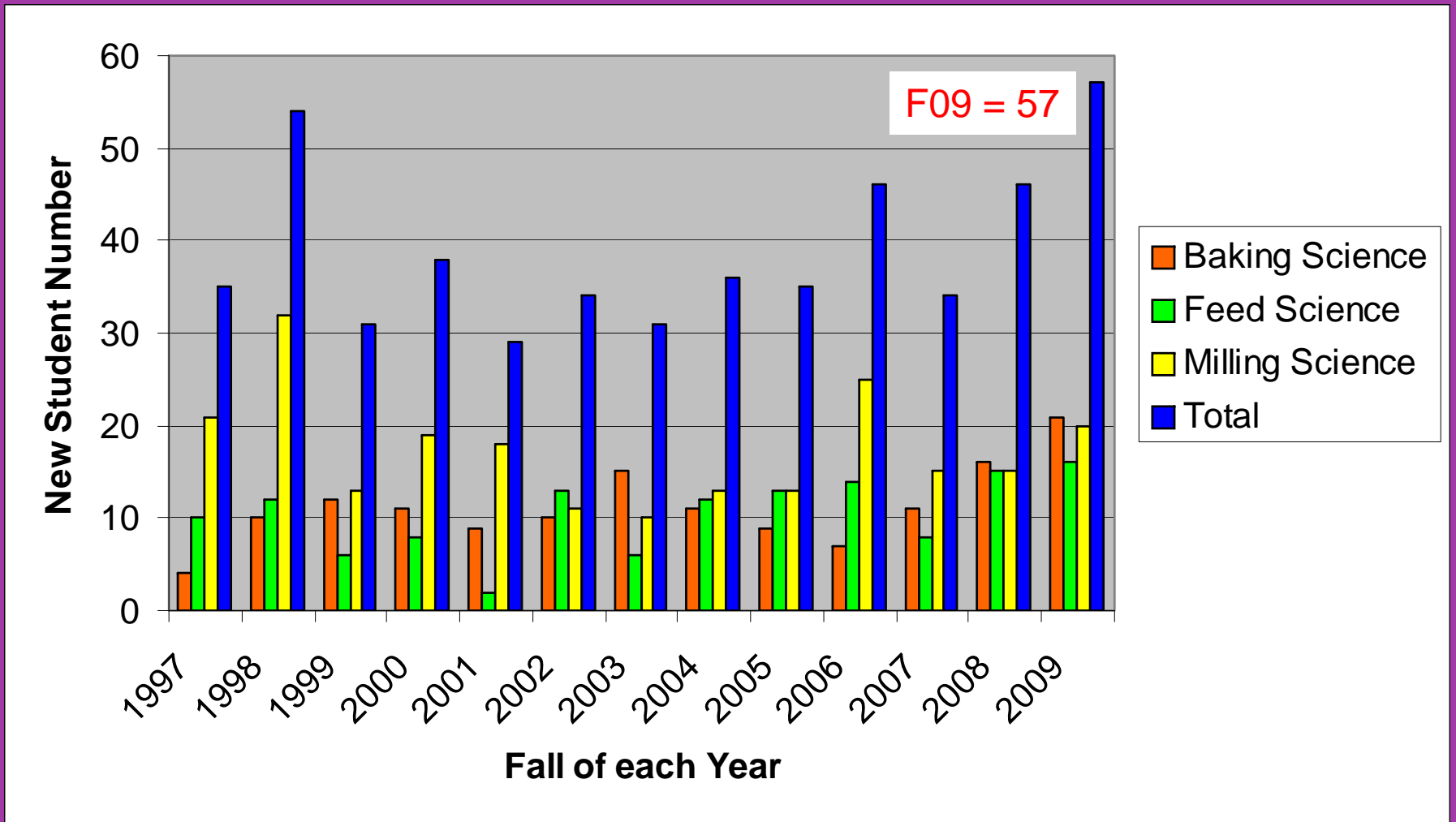
Bakery Science and Management Enrollment Sorted by Gender 1998-2009 (Fall'09: 81%F vs 19%M)



Feed Science and Management Enrollment Sorted by Gender 1998-2009 (F'09: 29%F vs 71%M)



New Student Enrollment - Fall 1997-2009



Keys to Increasing UG Student Enrollment in Grain Science & Industry

- Partnership btw K-State GSI and the Grain Industry
 - realize recruitment and retention of future employees starts by helping to fill the MSM, BSM and FSM pipelines at K-State
- Intentional and systematic recruitment plan
 - effective recruiting strategies; *“Every one recruit one!”*
 - Brains for Grains Recruitment and Scholarship Program
- Scholarship support
 - need to continue to grow scholarship pool
- Employment opportunities
 - Need internship opportunities and full-time job offers

→ More Out-of-State Recruiting Events...



April 2010 – Chicago Area Agricultural High School

May 2010 – Mill Museum, Minneapolis, Minnesota

May 2010 – Cereal City, Battle Creek, Michigan(!?)

Brains for Grains Recruitment and Scholarship Program

1. Request a recruitment kit and commit to annually visit 5 local high schools and one area college
2. Adopt at least one student recruit and offer a part-time or summer job opportunity while enrolled locally
 - Mentor your student recruit for a grain industry career
3. Sponsor at least one student recruit taking classes at a local college and pay tuition for 6-12 KSU distance learning credits in MSM, BSM or FSM
 - Bring to campus at least once to meet our faculty and students
4. Sponsor at least one student recruit to enroll in MSM, BSM or FSM and fund “full ride” scholarship at K-State
5. Offer your student recruit(s) and our other students summer internships and full-time employment
6. Take advantage of complimentary K-State scholarships
 - Legacy Scholarship, Midwest Student Exchange Program, Diversity Scholarship

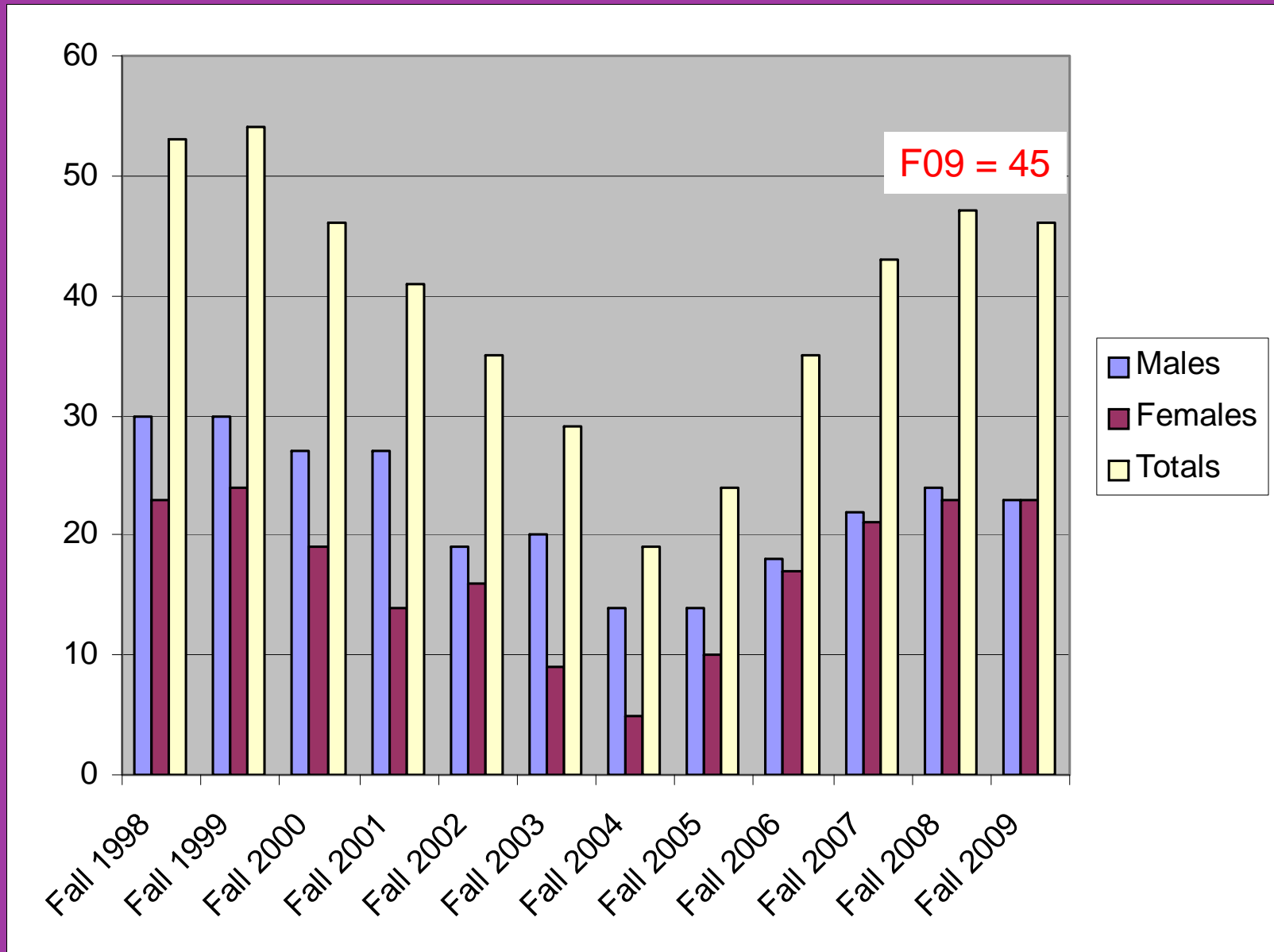
2009-2010 GSI Undergraduate Student Scholarships

| <u>Program</u> | <u>#</u> | <u>Amount</u> | <u>Average</u> |
|----------------|------------|------------------|----------------|
| BSM | 45 | \$87,825 | \$1,951 |
| MSM | 38 | \$57,505 | \$1,513 |
| FSM | 38 | \$30,525 | \$ 803 |
| TOTAL | 121 | \$175,555 | \$1,450 |



Grain Science Graduate Student Enrollment - Fall 1998-2009

(F'09: 50%F vs 50%M)



Where are we headed?

- Aware of our **W**eaknesses, we are preparing to face encroaching **T**hreats
 - Unfilled faculty and staff positions
 - Budget cuts; scholarship support; GRA tuition waivers
- Building on our **S**trengths, we are taking advantage of new **O**pportunities
 - New programs, services, partnerships, grants
- Forward and upward with optimism and anticipation
 - People (faculty, staff, students)
 - Vision, mission, priorities
 - Stakeholder support & Centennial Initiative
 - Updated Strategic Plan & CSREES Review



Centennial Celebration Initiative

- Increase scholarship support for our students
 - Goal: \$50,000
 - \$20,000 MSM; \$20,000 BSM; \$10,000 FSM
- Improve learning environment for our students
 - Goal: \$500,000
 - Renovate Shellenberger class rooms (310, 311)
 - Establish a Student Collaborative Work and Study Area (319)
 - Move and expand computer laboratory (319)
- Establish Two (2) Endowed Faculty Chairs
 - Goal: \$5,000,000
 - National funds to support unique programs with national impact
 - National funds to supply future talent for the grain industry



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“Leaders & Knowledge for the Global Grain Industry”