

**PLAN OF WORK**  
**SOUTH DAKOTA STATE UNIVERSITY**  
*Federal Fiscal Years 2005 – 2006*  
*October 1, 2004- September 30, 2006*

Introduction

The South Dakota State University (SDSU) College of Agriculture and Biological Sciences (ABS) is comprised of the South Dakota Agricultural Experiment Station (AES), South Dakota Cooperative Extension Service (CES), and Academic Programs (AP). The SDSU College of Family and Consumer Sciences (FCS) is actively involved in programs conducted with AES and CES. This institution serves South Dakota and the Northern Great Plains, and through cooperative arrangements conducts programs that impact the nation and world.

The population of South Dakota is ranked 46<sup>th</sup> in the nation, with 738,000 people (1998 Census Estimate). More than one-third of the population can be found in the ten largest counties, which represent the most active growth in population, income and economic development. Minnehaha County alone has 20 percent of the state's population. The remaining 56 counties and have substantially lower levels of population growth, if any, and pervasive levels of poverty. The Native American Reservations have substantially higher levels of poverty.

Historically, between 12 and 16 percent of South Dakota's population ranks below the poverty level. The 1998 U.S. Census Estimate indicated that South Dakota ranked 50<sup>th</sup> in average annual income, which in 1996 was \$20,724. Statewide unemployment is consistently at or below three percent. This indicates that most citizens are employed, but do not have high paying jobs. One result is that most families have two wage-earners, in some cases holding more than one job. These factors set the stage for out-migration from South Dakota to other places that are perceived to have job opportunities with higher income. Recently, this out-migration has slowed, and reversed in the 30-40 year old category as they return to South Dakota. Quality of family life issues are listed as key reasons for these people to return to their home state.

South Dakota has five reservations for Native Americans. The Native American population represents eight percent of the total state population. Three of the counties with reservations have been listed among the ten poorest counties in the United States. Unemployment, alcoholism, poor diet, diabetes and other health and social problems are prevalent in these areas. South Dakota State University has developed working agreements with the four 1994 Land Grant Institutions located in South Dakota, and is continuing to offer programs that address these social and economic needs.

Agriculture is the largest sector of the state's economy, generating \$17.0 billion in 1997. More than half of all farms earn less than \$50,000 per year, while 27% earn between \$100,000 and \$499,999 each year. This indicates there are two types of agriculture being conducted in South Dakota...large scale agriculture, and family farm agriculture. The

number of acres per farm continue to increase, while the number of farms decrease. Currently, there are 32,500 farms that average 1,418 acres.

The Northern Great Plains was known as the Great American Desert during the 19<sup>th</sup> century. For centuries stress has been a part of living in the Northern Great Plains. A major emphasis of research and Extension programs is aimed at assisting citizens in dealing with the various forms of stress that are a part of living here. To highlight this commitment to stress-related research and education, the ABS College adopted the Biostress philosophy during the early 1990's.

Biostress has been used as a term to recognize the various forms of stress; biotic, edaphic, climatic, economic, and even sociological. Additionally, the Biostress Philosophy has been used as a concept to implement broad interdisciplinary programs at SDSU. To solidify this concept, the Northern Plains Biostress Laboratory was dedicated in 1993. AES scientists, Extension specialists and teachers of diverse departments and disciplines work together and share resources.

The South Dakota Agricultural Experiment Station has research facilities at eight primary locations within the state. Many of the project leaders conduct research throughout the state, but the main SDSU campus serves as the home location for AES and is a center of activities for AES programs east of the Missouri River. Project leaders are also located at the SDSU West River Ag Center at Rapid City. The West River Center serves as the primary host for AES programs west of the Missouri River. Project leaders are also located at the Dakota Lakes Research Farm near Pierre (central SD) and at the Southeast South Dakota Research Farm near Beresford. These two farms focus on farming systems research, with no-till technology and irrigation being emphasized at Dakota Lakes and diversification of corn/soybean rotations and livestock feeding being emphasized at the Southeast Farm.

There are four research farms that are continuously staffed with support personnel. The AES scientists from Brookings and Rapid City conduct research at these stations, however, project leaders are not permanently located there. Crop production research is conducted at the Northeast Research Station near Watertown and at the Central Crops and Soils Research Station near Highmore. Neither of these stations are irrigated. Beef, sheep, and pasture research is conducted at the Antelope Station near Buffalo in Northwestern SD and at the Cottonwood Station in the West-Central part of the state. There are also several locations where AES research is conducted on cooperating stakeholder property. These cooperative arrangements greatly augment our research capabilities and provide direct linkages with many of our rural stakeholders.

The Cooperative Extension Service has offices located in all 66 South Dakota Counties. The combined presence of Agricultural Experiment Station Research Farms and County Extension Offices across the state means that the South Dakota State University College of Agriculture and Biological Sciences is uniquely able to deliver educational services and meet the needs of the people of South Dakota.

This integrated Plan of Work is a statement of the College's intended activities for the next five years, as required by the Agriculture Research, Extension, and Education Reform Act of 1998 (AREERA). This plan incorporates the five national goals established in the Cooperative State Research, Education and Extension Service (CSREES) Agency Strategic Plans and linked to the five national goals within the Research, Education and Economics Mission Area of the U.S. Department of Agriculture. This plan reflects substantial stakeholder input from all segments of South Dakota.

## Planned Programs

### **Goal 1: Enhance Economic Opportunities for Agricultural Producers**

*Replaces Goal 1: Competitive Agricultural System in a Global Economy.*

1862 Research - X

1862 Extension - X

#### **Program Description:** Competitive and Profitable Agricultural Production Systems

##### **Issue:**

The survival, stability and sustainability of South Dakota agriculture depends on production of high quality products, while minimizing production costs and maximizing market prices. Production systems that enhance efficiency and provide management options to deal with stress, including climatic extremes of the Northern Plains, are required. South Dakota agricultural producers must have access to technologies, knowledge and educational resources that support these needs while enhancing their global competitiveness.

Agriculture is the largest segment of South Dakota's economy. Farms and ranches have changed. No longer is the "family farm" a romantic vision of rural life. Today's family farm needs to be a business first, with pleasures of a rural way of life serving as a secondary benefit. There are several trends effecting agriculture, including: increased vertical linkages between producers; increased producer responsiveness to consumer demand, environmental issues, regulations and technology; knowledge is a critical, value added business commodity. Yet, today's farmers often do more than farm. In 1997, 42% of South Dakota's farmers reported some type of off-farm employment. As a result, two extremes are developing in agriculture at the expense of the mid-sized family farm: 1) small farms with a part-time operator, and 2) large farms with several employees and thousands of acres. Both types of agriculture require the educational services of a land grant university.

The enhancement of the agricultural sector of the economy is one of the most important long-term issues facing the state. Because of the complex nature of this issue, there are several supporting short- and intermediate term issues; however, for the purpose of this Plan of Work, the entire issue will be considered in the long term. While focusing on long term goals, SDSU strives to be responsive to immediate, short term needs of stakeholders. This Plan of Work is intended to allow programming flexibility for immediate responses to the changing needs of stakeholders. Examples of immediate needs may include educational programs to overcome the losses from major blizzards, drought, floods and other disasters.

**Performance Goal(s):**

South Dakota State University will support and advance agricultural production systems by:

1. Providing improved and sustainable agricultural and risk management skills and practices that allow producers to be competitive and profitable in the global agricultural market.
2. Expanding genetic foundations for crops and livestock.
3. Refining research-based management tools that address biotic and abiotic stress in the Northern Plains.
4. Identifying and evaluating new agricultural products and value-added opportunities.

**Output Indicators:**

1. Learning will occur through the delivery of educational programs using targeted educational materials including: distance education and multi-media programs, publications, scholarly papers and articles, and other educational products.
2. Improved crop varieties.
3. Value-added agricultural products and opportunities.

**Outcome Indicators:**

1. Improved management and marketing skills leading to increased profit opportunities for South Dakota agricultural producers.
2. Improved understanding of the physiology and ecology of crops and livestock, pests and diseases, leading to increased production efficiencies.
3. Greater value-added opportunities for South Dakota producers.

**Key Program Component(s):**

There is substantial collaboration at the departmental and college level among the SDSU Cooperative Extension Service, Agricultural Experiment Station and academic faculty. SDSU follows the traditional land grant model in that AES is primarily responsible for the development of new knowledge; CES is primarily responsible for dissemination and application of the knowledge; and AP are primarily responsible for undergraduate and graduate education. The three entities have specific missions, yet coordinate efforts to maximize resources and address stakeholder needs. Whereas AES and CES efforts are integrated, one entity often takes the lead role. The following summary identifies planned programs and lead agencies.

**Crop Systems**

Breeding, Genetics, Molecular Genetics – *AES*

Plant Physiology and Nutrition - *AES*

Crop Management, Disease and Pest Control – *AES & CES*

Alternative Crop Enterprises - *AES*

## Livestock Systems

Animal Physiology and Nutrition - *CES*  
Breeding, Genetics, Molecular Genetics – *AES*  
Forage/Range Livestock - *AES*  
Livestock Management, Health, and Welfare - *CES*  
Alternative Livestock Enterprises - *CES*  
Food Safety and Structures - *CES*

## Management Systems

Marketing, Risk Management & Regulations, & Financial Planning - *CES*  
Human Resource Management as it relates to Farm Management - *CES*  
Structure of Agriculture: Value-Added Processing, Networks & Co-ops - *AES*  
Integrated Management of Livestock, Crop and Conservation Systems - *CES*  
Production Systems, Economic Impact & Sustainability - *AES*  
2+2+2 (Native American Education) - *AP*  
Student Internships and Experiential Learning - *AP*

## International Programs

The College of Agriculture and Biological Sciences plays an active role in efforts to increase global awareness and cultural understanding among faculty and students. The SDSU Office of International Programs coordinates these efforts through faculty development study and work outside of the United States; and by bringing faculty and students from other countries to SDSU to strengthen the international culture of the campus.

SDSU has international faculty and student exchange programs with:

Yunnan Normal University, People's Republic of China  
Autonomous University of Morelos, Mexico  
Chungnam National University, South Korea  
Manchester Metropolitan University, England  
Harper Adams University, England

SDSU actively participates in consulting and research programs with:

International Arid Lands Consortium  
Universidad Academica Campesina, Bolivia  
Institute of Soil Sciences and Plant Cultivation, Poland  
Chinese Academy of Agricultural Sciences, People's Republic of China

## Analytical Services

Animal Disease Research and Diagnostic Laboratory (70% - animal disease diagnostics) - *AES*  
Analytical Services/Olson Biochemistry Lab (70% - forage and feed analysis, water analysis, fertilizer & pesticide) - *AES*

**Internal and External Linkages:**

Collaboration will continue between CES and AES faculty and staff. Moreover, partnerships will continue and be expanded with federal research laboratories and agencies; other land grant universities; local agribusinesses such as lenders, sale barns and others as appropriate to this goal.

Specifically, this includes: regional research projects involving cooperation with other land grant institutions; cooperative research with VAC-CP in tropical agriculture; an academic project linking SDSU with all four 1994 Institutions in South Dakota; cooperation and collaboration with the South Dakota Department of Agriculture; South Dakota Department of Environment and Natural Resources; U.S. Department of Energy; USDA Natural Resources Conservation Service; USDA Farm Service Agency, and others.

**Target Audiences:**

The target audiences are: agricultural producers in South Dakota, and where appropriate, surrounding states; and students. Additional attention will be devoted to traditionally under-served sectors of the population, including the Native American population. Programs will be offered for organic agricultural producers, and small farms and ranches. Care will be given to meet the needs of the geographically disadvantaged through the use of appropriate distance education methods.

**Program Duration:** This program of AES projects and CES projects will continue for the two year span of this Plan of Work. Each project will prepare appropriate reports and receive annual administrative review and ongoing stakeholder input to insure the goals are being met. Based on review and stakeholder input, changes may occur within the two year span of this program to assure that resources are used in a manner that best serves the target audiences.

In addition, this Plan of Work projects that state and federal fiscal resources will remain steady at funding levels reported in the FY 2003 Annual Report. However, events ranging from federal budget shifts due to the War against Terrorism to a continued sluggish economy may likely impact federal allocations. On the state level, the on-going drought and other budget issues may also impact state allocations. SDSU will exercise appropriate management to deal with budgets that do not meet the projections upon which this plan is based.

**Allocated Total Resources**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
1	5,666,145	5,666,145

**Projected FTE'S**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
1	210.04	210.04

**Goal 2: Support Increased Economic Opportunities and Improved Quality of Life in Rural America**

*Replaces Goal 5: Economic Development and Quality of Life for People and Communities.*

- 1862 Research - X
- 1862 Extension - X

**Program Description:** Economic Opportunity and Quality of Life

**Issue:**

Quality of life and economic opportunity issues impact all South Dakotans. This is a multi-faceted issue that has different meaning for each individual, but common trends that connect us as a state. South Dakota ranks 13<sup>th</sup> best in a child well-being profile and is recognized as a place with strong family traditions, work ethic and religious beliefs. However, the state is also faced with risk issues that potentially threaten the family system. Stakeholders have identified important issues as: education, employment/income/poverty, hunger/undernutrition, family structure, child care, teenage sexual behaviors, abuse/neglect, violence, self-destructive behaviors and community. In addition, families are challenged by issues such as inadequate child care, inadequate services for dependent elderly, lack of money managing skills, financial insecurity, the lack of positive consumer skills, poverty, impact of work, and threatened values.

South Dakota recently ranked number two in the nation with respect to the percent of women in the labor force with children under the age of six. In just a decade, this has increased by 20 percent. While South Dakotan's do not lack for jobs, they are often underemployed. There is disproportionately low family income received for the amount of work conducted.

The individual struggle to improve one's quality of life is painted on the larger canvas of South Dakota's cultural and social environment. Net out-migration of people from the state has been the norm since 1930. From 1980 to 1988, almost 29,000 more South



Dakotans left the state than moved in. That is equivalent to losing all the people in Watertown, Madison and Spearfish, three moderately large communities by South Dakota standards. Although several things motivate this migration, economic factors, including jobs with higher incomes, are perhaps the most important. Several areas of the state are “pockets of poverty.” Some areas, such as reservations, have been traditionally poor, whereas others show more recent increases in poverty.

The out-migration typically involves younger people, with the older population staying behind. South Dakotans over age 65 comprise nearly 15% of the total population. The most rural counties have significantly higher populations of elderly, and are more likely to live in poverty. Health care, nutrition, community facilities and housing are important issues for communities with higher populations of senior citizens.

This goal is unique in that basic needs must be met even as the long term issue is being addressed, particularly where resources are limited or stresses are so great as to hamper people's ability to address the challenges they face. The quality of life continuum may start with such basic survival skills as food purchase and preparation, and progress through financial management, clothing acquisition, and farm and home safety.

Because of the complex nature of this issue, there are several supporting short-term issues and intermediate term issues. For the purpose of this Plan of Work, the entire issue will be considered in the long term. While focusing on long term goals, SDSU strives to be responsive to immediate, short term needs of citizens. This Plan of Work is intended to allow programming flexibility for immediate responses to the changing needs of stakeholders.

**Performance Goal(s):**

South Dakota State University will support and advance economic opportunity and quality of life by:

1. Helping families learn how to cope with challenges and meet individual needs, allowing them to be more resilient to stress and crisis.
2. Mobilizing community development efforts that enhance local job opportunities, community facilities and services, housing, and strengthen the perceived future of the individual community.
3. Advocating retirement planning, and initiating efforts to enhance the quality of life in senior years.
4. Fostering volunteerism.
5. Helping youth to become self-reliant, productive members of society.
6. Providing career opportunities through higher education.

**Output Indicators:**

1. Learning will occur through the delivery of educational programs using targeted educational materials including: distance education and multi-media programs, publications, scholarly papers and articles, and other educational products.
2. Partnerships with development agencies and organizations.

**Outcome Indicators:**

1. Increased volunteerism.
2. Families that are more resilient to stress and crisis.
3. Improved financial planning for all stages of life.
1. Increased youth competence in the areas of: health and physical skills, personal and social skills, cognitive and creative skills, vocational skills, and citizenship skills..

**Key Program Component(s):**

There is substantial collaboration at the departmental and college level among the SDSU Cooperative Extension Service, Agricultural Experiment Station and academic faculty. SDSU follows the traditional land grant model in that AES is primarily responsible for the development of new knowledge; CES is primarily responsible for dissemination and application of the knowledge; and Academic Programs are primarily responsible for undergraduate and graduate education. The three entities have specific missions, yet coordinate efforts to maximize resources and address stakeholder needs. Whereas AES and CES efforts are integrated, one entity often takes the lead role. The following summary identifies planned programs and lead agencies.

## Community Resiliency and Human Capital

- Community Planning & Economic Development - *CES*
- Human Resource Development – *CES*
- Leadership Development - *CES*

## Youth and Family

- 4-H & Youth Development – *CES*
- Strengthening Family Relationship and Roles - *CES*
- Human Stress, Population and Human Health – *AES*

## Investment and Finance

- Enhancing Quality of Life at Midpoint and Beyond – *CES*
- Resource Management - *CES*
- Marketing and Decision-Making Data - *AES*

## Career Development

- Expanding Student Horizons for Environmental Awareness - *AP*
- Training Professionals to meet the needs of South Dakota - *AP*

## Analytical Services

- Seed Testing Laboratory (100% - marketability & product control) - *AES*

**Internal and External Linkages:**

Collaboration will continue between Extension and research staff. In addition, partnerships will continue and be expanded with federal research laboratories and agencies; other land grant universities; local agribusinesses such as lenders, sale barns and others as appropriate to this goal.

Specifically, this includes: regional research projects involving cooperation with other land grant institutions; cooperation and collaboration with the South Dakota Department of Agriculture; South Dakota Department of Tourism; South Dakota Department of Social Services; Job Service; South Dakota Department of Health; Ministerial Associations; Head Start; Governor’s Office of Economic Development; Rural Electric Cooperatives; U.S. Small Business Administration; Sinte Gleska University Business Development Center and other 1994 Institutions; Tribal Councils; S.D. Retailers Association; AARP; mental health agencies; elected community officials; school officials; Chambers of Commerce; Legal Services Offices; health care professionals; international student organizations; and others.

**Target Audiences:**

The target audiences are: youth, families, the elderly, minorities, community businesses, entrepreneurs, community leaders, senior citizens, and communities in “poverty pockets” in South Dakota, and where appropriate, surrounding states. Additional attention will be devoted to traditionally under-served sectors of the population, including the Native American population. Care will be given to meet the needs of the geographically disadvantaged through the use of appropriate distance education methods.

**Program Duration:** This program of the AES and CES projects will continue for the two year span of this Plan of Work. Each project will prepare appropriate reports and receive annual administrative review and ongoing stakeholder input to insure the goals are being met. Based on review and stakeholder input, changes may occur within the two year span of this program to assure that resources are used in a manner that best serves the target audiences.

In addition, this Plan of Work projects that state and federal fiscal resources will remain steady at funding levels reported in the FY 2003 Annual Report. However, events ranging from federal budget shifts due to the War against Terrorism to a continued sluggish economy may likely impact federal allocations. On the state level, the on-going drought and other budget issues may also impact state allocations. SDSU will exercise appropriate management to deal with budgets that do not meet the projections upon which this plan is based.

**Allocated Total Resources**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
2	3,065,918	3,065,918

**Projected FTE'S**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
2	71.94	71.94

### Goal 3: Enhance Protection and Safety of Nation's Agriculture and Food Supply

*Replaces Goal Two: Safe and Secure Food and Fiber System*

1862 Research - X

1862 Extension - X

**Program Description:** A safe and secure food and fiber system.

**Issue:**

Because agriculture is the largest segment of South Dakota's economy, the goal of a safe and secure food and fiber system has two dimensions: 1) an abundant supply of safe, high quality food; and, 2) a prosperous state economy. This Plan of Work treats both parts of this question as long term issues. SDSU programs also reflect homeland security needs, issues and requested programs.

Food safety is influenced at every step along the production and marketing chain from the producer to the processor to the consumer. Most food scientists rank food safety hazards, from greatest to least, as food borne hazards of microbial origin, nutritional hazards, contamination hazards, food toxins of natural origin, and food additives. This is basically the reverse of the public's conception of food risks. The reported incidence of food borne illness from pathogenic bacteria is increasing.

Food safety and quality concerns often put various groups within our society in conflict. Food producers must stay informed of consumer perceptions of product safety and quality. Perhaps more importantly, producers must be proactive in developing and maintaining production quality assurance programs that ensure a safe, high quality food supply while protecting the environment. Consumer's lack of confidence about the ability of the regulatory system to protect their health are increasing the need for food safety education and for communication about risk management.

**Performance Goal(s):**

South Dakota State University will support and advance a safe and secure food and fiber system by:

1. Helping citizens adopt safe food selection, preparation, service and storage practices.
2. Fostering rural-urban co-existence and use of natural resources by refining practices for the safe handling, storage and disposal of pesticides, livestock waste and other possible environmental contaminants.
3. Studying the impact of present and future regulations on farms, producers, families and communities.
4. Identifying and evaluating new marketing systems for agricultural products.

**Output Indicators:**

1. Learning will occur through the delivery of educational programs using targeted educational materials including: distance education and multi-media programs, publications, scholarly papers and articles, and other educational products.
2. New practices for safe handling of food, and of possible environmental contaminants.
3. Analysis of options for new ways of processing and marketing agricultural commodities.
4. Providing Analytical Services that determine food safety and quality.

**Outcome Indicators:**

1. Enhanced food handling skills leading to reduced incidences of food-borne illness.
2. Reduced agricultural-based contamination of natural resources.
3. New processing, packaging and marketing methods for agricultural commodities.

**Key Program Component(s):**

There is substantial collaboration at the departmental and college level among the SDSU Cooperative Extension Service, Agricultural Experiment Station and academic faculty. SDSU follows the traditional land grant model in that AES is primarily responsible for the development of new knowledge; CES is primarily responsible for dissemination and application of the knowledge; and Academic Programs are primarily responsible for undergraduate and graduate education. The three entities have specific missions, yet coordinate efforts to maximize resources and address stakeholder needs. Whereas AES and CES efforts are integrated, one entity often takes the lead role. The following summary identifies planned programs and lead agencies.

**Food Safety**

Food Safety, Preservation and Training - *CES*

Quality Assurance Programs – *CES*

Food Quality/e.coli 157.H7 Testing - *AES*

Food Service Student Internships – *AP/Family & Consumer Sciences*

**Security for Food Systems**

Pesticide Use Standards – *AES*

Agricultural Product Marketing Systems – *AES & CES*

Multidisciplinary Food Safety Committee - *CES*

Pesticide & Livestock Waste Management – *CES*

Governmental Regulations – Production agriculture, urban communities, & environmental issues – *CES*

**Analytical Services**

Animal Disease Research and Diagnostic Laboratory (30% - food safety) - *AES*

Nutrition and Food Science Laboratory (50% - food product labeling) - *AES*

State Dairy Laboratory (100%) - *AES*

Analytical Services – Olson Biochemistry Laboratory (30% - processed food analysis) – *AES*

**Internal and External Linkages:**

Collaboration will continue between Extension and research staff. In addition, partnerships will continue and be expanded with federal research laboratories and agencies; other land grant universities; food service businesses, and others as appropriate to this goal.

Specifically, this includes: regional research projects involving cooperation with other land grant institutions; cooperation and collaboration with the South Dakota Department of Agriculture; South Dakota Department of Environment and Natural Resources; South Dakota School Districts, hospitals, day care and other food service providers; Poison Control Centers; The U.S. Centers for Disease Control and Prevention; U.S. Environmental Protection Agency; USDA Natural Resources Conservation Service; USDA Farm Service Agency, and others.

**Target Audiences:**

The target audiences are 1) consumers and food preparers in family or commercial/agency settings in South Dakota, and where appropriate, surrounding states; and 2) landowners, renters or managers responsible for agricultural chemical and waste product management; 3) food processors i.e. locker plants; and 4) students.

Additional attention will be devoted to traditionally under-served sectors of the population, including the Native American population, small farms, and rural and urban poor. Care will be given to meet the needs of the geographically disadvantaged through the use of appropriate distance education methods.

**Program Duration:** This program of AES and CES projects will continue for the two year span of this Plan of Work. Each project will prepare appropriate reports and receive annual administrative review and ongoing stakeholder input to insure the goals are being met. Based on review and stakeholder input, changes may occur within the two year span of this program to assure that resources are used in a manner that best serves the target audiences.

In addition, this Plan of Work projects that state and federal fiscal resources will remain steady at funding levels reported in the FY 2003 Annual Report. However, events ranging from federal budget shifts due to the War against Terrorism to a continued sluggish economy may likely impact federal allocations. On the state level, the on-going drought and other budget issues may also impact state allocations. SDSU will exercise appropriate management to deal with budgets that do not meet the projections upon which this plan is based.

**Allocated Total Resources**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
3	636,610	636,610

**Projected FTE'S**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
3	14.15	14.15

**Goal 4: Improve the Nation's Nutrition and Health**

*Replaced Goal 3: Healthy, Well Nourished Population*

1862 Research - X

1862 Extension - X

**Program Description:** A healthy, well-nourished population.

**Issue:**

Concern about nutrition and diet, and their relationship to human health has reached an all-time high. Of the ten leading causes of death due to disease, five are associated with diet: coronary heart disease, several types of cancer, stroke, diabetes mellitus and atherosclerosis. Obesity, a risk factor in all leading causes of death in the U.S., affects 30% of women, 15% of men, and 25% of adolescents, with the highest rates observed among low-income and minority groups. South Dakota ranks 8<sup>th</sup> in the nation in the percent of the population which is overweight.

Proper nutrition is important throughout the life of an individual. Research has shown that diet plays an important role in the growth and development of brain cells in the pre-natal and early childhood stages of development. Proper nutrition is a factor in maintaining an older individual's independence in health, social and psychological well being. The physiological changes of aging can affect a person's food intake and nutritional status. Poor nutrition status can be related to poor general health and chronic diseases in all individuals. Nationally, 85 percent of all older persons age 60 and older have at least one chronic condition that can benefit from nutrition intervention. Nutritional education is a particularly important component in reducing the intensity of negative health changes due to aging. Psychological and socioeconomic factors present in South Dakota, may also influence food intake and nutritional status, and thus the health of the residents. A disproportionate burden of diet-related disease is borne by minority, low-income, and educationally disadvantaged persons. Such populations have higher rates of high blood pressure, stroke, and diabetes mellitus than the general population.

Rural safety is an important component of the health issue. Agriculture is recognized as one of the nations' deadliest occupations. With more than 25 percent of South Dakota's

population working in some area of agriculture, agricultural safety is a critical issue. The leading cause of injuries involve agricultural machinery, with open wounds and fractures being the most common injury. Most serious farm injuries leave the individual with an impairment or disability of some type. These disabilities often force rural families to find new employment of the farm.

Clearly, health and nutrition are long term issues, and are approached as such in this Plan of Work. This issue represents substantial collaboration between the SDSU Colleges of Agriculture and Biological Sciences, and Family and Consumer Sciences.

**Performance Goal(s):**

South Dakota State University will support and advance the goal of a healthy, well-nourished population by:

1. Providing information regarding healthy food choices, budgeting for food purchases, and proper diet.
2. Enhancing the nutrition and health benefits, and consumer acceptance of agricultural products.
3. Conducting agricultural safety training; and also assistance in adapting farms to operators with disabilities.
4. Conducting health maintenance programs focusing on preventative health care strategies.

**Output Indicators:**

1. Learning will occur through the delivery of educational programs using targeted educational materials including: distance education and multi-media programs, publications, scholarly papers and articles, and other educational products.
2. New food products that have enhanced health benefits.

**Outcome Indicators:**

1. Health-conscious citizens that actively pursue preventative health care strategies.
2. Improved diet and nutrition for South Dakotans.
3. Reduced deaths and injuries from agricultural accidents.

**Key Program Component(s):**

There is substantial collaboration at the departmental and college level among the SDSU Cooperative Extension Service, Agricultural Experiment Station and academic faculty. SDSU follows the traditional land grant model in that AES is primarily responsible for the development of new knowledge; CES is primarily responsible for dissemination and application of the knowledge; and Academic Programs are primarily responsible for undergraduate and graduate education. The three entities have specific missions, yet coordinate efforts to maximize resources and address stakeholder needs. Whereas AES and CES efforts are integrated, one entity often takes the lead role. The following summary identifies planned programs and lead agencies.



## Health and Nutrition

EFNEP & FNP - *CES*

Diet & Nutrition - *CES*

Insurance & Health Care - *CES*

Food Product Development & Consumer Research – *AES*

Food Selection and Choice - *AES*

## Safety

Agricultural Safety Training - *CES*

Agribility – *CES*

## Analytical Services

Nutrition and Food Science Laboratory (50% - dietary analysis) - *AES*

### **Internal and External Linkages:**

Collaboration will continue between Extension and research staff. In addition, partnerships will continue and be expanded with federal research laboratories and agencies; other land grant universities; business partners such as health care providers and insurers, public health staff, agricultural equipment manufacturers, commodity nutritionists, and others as appropriate to this goal.

Specifically, this includes: regional research projects involving cooperation with other land grant institutions; cooperation and collaboration with the South Dakota Department of Agriculture; South Dakota Department of Social Services; Easter Seals, Avera McKennan Hospital, and others.

### **Target Audiences:**

The target audiences are: South Dakota consumers, farm workers, children in rural areas, students, and the elderly. Additional attention will be devoted to traditionally underserved sectors of the population, including the Native American population, farmers with disabilities, and low income and educationally disadvantaged persons. Care will be given to meet the needs of the geographically disadvantaged through the use of appropriate distance education methods.

**Program Duration:** This program of AES and CES projects will continue for the two year span of this Plan of Work. Each project will prepare appropriate reports and receive annual administrative review and ongoing stakeholder input to insure the goals are being met. Based on review and stakeholder input, changes may occur within the two year span of this program to assure that resources are used in a manner that best serves the target audiences.

In addition, this Plan of Work projects that state and federal fiscal resources will remain steady at funding levels reported in the FY 2003 Annual Report. However, events ranging from federal budget shifts due to the War against Terrorism to a continued sluggish economy may likely impact federal allocations. On the state level, the on-going drought and other budget issues may also impact state allocations. SDSU will exercise

appropriate management to deal with budgets that do not meet the projections upon which this plan is based.

**Allocated Total Resources**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
4	635,791	635,791

**Projected FTE'S**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
4	23.36	23.36

**Goal 5: Protect and Enhance the Nation's Natural Resource Base and Environment.**

*Replaces Goal 4: Greater Harmony Between Agriculture and the Environment.*

1862 Research - X

1862 Extension - X

**Program Description:** Greater harmony between agriculture and the environment.

**Issue:**

Balancing production agriculture, natural resources, wildlife, rural and urban communities, and the environment is a constant struggle. For production agriculture to be viable, it must also be profitable. Intensifying crop and livestock production has often made farming more profitable, but has also increased the risk of environmental damage. Concentrated crop and livestock production may result in increased pesticide and fertilizer use and high concentrations of animal manure. More stringent water pollution control regulations have been enacted for South Dakota livestock operations larger than 1,000 animal units.

Water quality is an environmental concern for both rural and urban residents. Nitrate concentrations are increasing in aquifers that supply small South Dakota towns and rural water systems. Several well fields have been closed because of nitrate concentrations above legal limits. While there is no single cause, fertilizer and manure use and storage are often suspected. Well water sampling surveys have regularly detected pesticides. However, pesticide concentrations are not yet at a level to severely affect water quality. Surface water quality in South Dakota has been reduced dramatically with algae bloom occurring almost every year in most lakes, ponds and stock dams. Recreational uses are severely restricted in some instances, and livestock deaths are occasionally reported. Sources of nutrients that promote algae blooms often include feedlots and septic systems if used near lakes, but soil erosion is also a likely contributor.

Integrating sustainable natural resource management with profitable livestock and farming management systems is a complex, long-term issue, with many associated intermediate and short term issues. For the purpose of this Plan of Work, the entire issue will be considered in the long term. While focusing on long term goals, SDSU strives to be responsive to immediate, short term needs of stakeholders. This Plan of Work is intended to allow programming flexibility for immediate responses to the changing needs of stakeholders.

**Performance Goal(s):**

South Dakota State University will support and advance greater harmony between agriculture and the environment by:

1. Creating livestock housing and management practices that are environmentally sound.
2. Identifying appropriate pesticide uses that preserve natural resources while enhancing agricultural production
3. Monitoring the quality of South Dakota’s water.
4. Assuring that wildlife and agricultural production can productively co-exist.
5. Foster the implementation of the Sun Grant Initiative.

**Output Indicators:**

1. Learning will occur through the delivery of educational programs using targeted educational materials including: distance education and multi-media programs, publications, scholarly papers and articles, and other educational products.
2. Construction plans for livestock facilities.
3. Pesticide applicator certifications.
4. Pesticide and water quality tests.
5. Continued planning and federal funding leading to implementation of the Sun Grant System.

**Outcome Indicators:**

1. Improved livestock facilities that protect the environment while allowing profitable animal production.
2. Increased understanding of how agricultural practices impact all natural resources.
3. Wildlife that co-exist with agriculture and rural land uses.
4. Establishment of Sun Grant Centers within the Land Grant System.

**Key Program Component(s):**

There is substantial collaboration at the departmental and college level among the SDSU Cooperative Extension Service, Agricultural Experiment Station and academic faculty. SDSU follows the traditional land grant model in that AES is primarily responsible for the development of new knowledge; CES is primarily responsible for dissemination and application of the knowledge; and Academic Programs are primarily responsible for undergraduate and graduate education. The three entities have specific missions, yet coordinate efforts to maximize resources and address stakeholder needs. Whereas AES and CES efforts are integrated, one entity often takes the lead role. The following summary identifies planned programs and lead agencies.

## Agriculture & Environment

Livestock Waste - *CES*

Pesticide and Fertilizer Use and Management – *CES*

## Water

Environmental Impact of Chemical/Fertilizer Management - *AES*

Water Movement – *AES*

Quality - *CES*

## Natural Resources

Wildlife & Fisheries - *AES*

Wetland, Forest, Prairie & Riparian Areas - *AES*

Soil – *AES/CES*

Weather – *CES/AES*

## Analytical Services

Soil Testing Laboratory (100% - soil fertility, plant analysis) – *AES*

Water Testing Laboratory (100% - water analysis) – *AES*

## Sun Grant

National initiative planning and implementation – *AES/CES*

Renewable energy research - *AES*

### **Internal and External Linkages:**

Collaboration will continue between Extension and research staff. In addition, partnerships will continue and be expanded with federal research laboratories and agencies; other land grant universities; independent crop consultants, local water districts, livestock facility architects and builders, and others as appropriate to this goal.

Specifically, this includes: regional research projects involving cooperation with other land grant institutions; cooperation and collaboration with the South Dakota Department of Agriculture; South Dakota Department of Environment and Natural Resources; South Dakota Geological Survey; S.D. Association of Conservation Districts; South Dakota Non-point Source Pollution Task Force; South Dakota County Commissions and Zoning Boards; USDA Natural Resources Conservation Service; USDA Farm Service Agency; and others.

### **Target Audiences:**

The target audience include: landowners, rural residents, students, and agricultural producers in South Dakota, and where appropriate, surrounding states. Additional attention will be devoted to traditionally under-served sectors of the population, including the Native American population, and small farms and ranches. Care will be given to meet the needs of the geographically disadvantaged through the use of appropriate distance education methods.

**Program Duration:** This program of AES and CES projects will continue for the two year span of this Plan of Work. Each project will prepare appropriate reports and receive annual administrative review and ongoing stakeholder input to insure the goals are being met. Based on review and stakeholder input, changes may occur within the two year span of this program to assure that resources are used in a manner that best serves the target audiences.

In addition, this Plan of Work projects that state and federal fiscal resources will remain steady at funding levels reported in the FY 2003 Annual Report. However, events ranging from federal budget shifts due to the War against Terrorism to a continued sluggish economy may likely impact federal allocations. On the state level, the on-going drought and other budget issues may also impact state allocations. SDSU will exercise appropriate management to deal with budgets that do not meet the projections upon which this plan is based.

**Allocated Total Resources**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
5	963,165	963,165

**Projected FTE'S**

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
5	50.52	50.52

### Stakeholder Input

The College of Agriculture and Biological Sciences solicits formal stakeholder input in many forms, from many sources, and at many locations. Methods of receiving stakeholder input include: Agricultural Experiment Station Research Farm Advisory Boards; Research Review Meetings with agricultural checkoff groups including the South Dakota Soybean Research and Promotion Council, South Dakota Corn Utilization Council, South Dakota Beef Industry Council, South Dakota Oilseeds Council, South Dakota Pork Producers Council, South Dakota Wheat Commission, and others.

Input is also received from state agricultural commodity groups including Ag Unity, the South Dakota Pork Alliance, the South Dakota Stockgrowers/Cattlemen, and the South Dakota Veterinary Medical Association; and from meetings with organizations that fund research such as the National Institutes of Health, U.S. Department of Energy, National Science Foundation, NASA, Environmental Protection Agency, and the National Centers for Disease Control and Prevention. In addition, stakeholder input is solicited from governmental agencies, including: the Office of the Governor, the South Dakota Department of Agriculture, South Dakota Department of Environment and Natural Resources, South Dakota Game, Fish and Parks, South Dakota Department of Education and Cultural Affairs, Office of the State Veterinarian, Social Services, Job Service, National Agricultural Statistics Service, 1994 Institutions, and others.

Stakeholder input is received at SDSU field day tours; SDSU agricultural meetings; Community Leader Meetings throughout the state; meetings with the South Dakota Board of Regents, South Dakota Legislature, and other elected officials and boards; and events open to the public such as the South Dakota State Fair and DakotaFest. Additional input is generated during comprehensive CSREES Departmental and Institutional Reviews, which span teaching, research and Extension activities.

County Extension Advisory Boards are required by South Dakota law, and provide guidance and direction for county programming that target priority needs and issues, and are appointed by County Commissioners. Membership on this board is required by state statute to represent the racial population mix of the county and of the various interest groups served by Extension.

The State Extension Advisory Board provides guidance and direction to the Cooperative Extension Service, and informally to the Agricultural Experiment Station. Members of this board are elected from each County Extension Advisory Board and the 1994 land grant institutions.

During the previous Plan of Work, South Dakota State University's College of Agriculture and Biological Sciences expanded its stakeholder input procedure. This will enhance the opportunities for South Dakotans to offer suggestions and requests for research and educational programs. It will rely heavily on the Cooperative Extension Service assessment planning data.

The revised system allowed stakeholder input to be directed across the broad scope of the College of Agriculture and Biological Sciences, rather than exclusively to the Cooperative Extension Service or Agricultural Experiment Station. The multidisciplinary input system will use a variety of techniques that may include: direct input, brainstorming, surveys and questionnaires, nominal group technique and other appropriate methods.

An important change was the establishment of 13 Field Education Units representing all parts of South Dakota. Each unit is comprised of 1 to 9 counties. A fourteenth on-campus stakeholders input session is dedicated to soliciting input from SDSU students, faculty and other Regental constituents. Stakeholders from each Field Education Unit across the entire state were identified, giving care to include any group or audience that may be or previously have been underrepresented or underserved. An invitation was issued inviting representatives from each of the identified stakeholder groups to participate in the program review and development planning session. A series of general news releases were issued inviting all citizens to participate in the process, even though they may not have been directly contacted.

The missions of County Extension Advisory Boards and State Extension Advisory Board will continue, and three new advisory boards will be created. These include:

*Field Education Unit Advisory Boards* – these provide guidance and direction for multi-county educational programs, and are elected to represent County Extension Advisory Boards.

*State-Wide, Long Range Planning Board* – this board solicits and coordinates input from multiple, statewide constituencies to ensure that state priorities and goals are being addressed through the Cooperative Extension Service. Members are appointed by the President of South Dakota State University.

*Campus Resource Council* – this board identifies SDSU resources available to the Cooperative Extension Service, coordinates program delivery and provides efficient access to educational expertise and opportunities. Members are appointed jointly by the SDSU Vice President of Academic Affairs, Director of the Cooperative Extension Service, and Dean of the College of Agriculture and Biological Sciences. It includes representatives from SDSU academic colleges and other campus units.

Administrators evaluate all requests and comments from stakeholders to determine if clear patterns of needs exist, and if resources can be directed to the client requests. CES educators, specialists, and AES scientists actively seek out input to insure that research and education programs are fine-tuned to the current needs of stakeholders.

The SDSU Annual Accomplishment Report will summarize the impact of SDSU programs on stakeholder needs.

Merit and Peer Review

All AES research projects are subjected to peer and merit review prior to implementation. All Hatch and multi-state projects require independent peer reviews from two scientists that are knowledgeable in the respective subject area. The department head or a departmental executive committee identifies peer reviewers. The department head and the AES Director serve as merit reviewers.

A standard review instrument facilitates peer and merit reviews. Reviewers are required to comment on why the proposed research is needed, it's relevance to agriculture, the target audience, and how it compliments other research.

Proposals for research grants that are funded by stakeholder groups are subjected to review by the stakeholders themselves and by college administrators. Much like the CRIS system, stakeholder groups ask for annual progress reports on funded research.

The CES peer review will be a two-phase process: 1) the SDSU Cooperative Extension Service Program Leader for Agriculture and Natural Resources and the Program Leader for Family/Youth-4-H will serve as the peer review team for the respective components of the plan of work. 2) The Program Leaders from Kansas, Nebraska and North Dakota will review the South Dakota Plan of Work. In turn, the Program Leaders from South Dakota will review the Plans of Work from North Dakota, Kansas and Nebraska.

Multi-Institutional, Multi-Disciplinary, Multi-State, and Integrated Activities

To estimate for planning purposes the Multi-Institutional, Multi-Disciplinary, Multi-State and other Integrated Activities that may occur during this plan of work, staff were surveyed to determine current efforts and future plans. Based on the results of this survey and administrative goals, South Dakota State University estimates that approximately 25 percent of Smith-Lever & Hatch funds will be used to address "Multi" activities. For Extension, this represents a combined total of 12% Multi-State, and 13% Integrated for a total of 25%. The following tables summarize how the 25 percent "Multi" funds will be distributed among the five goal areas.

SOUTH DAKOTA STATE UNIVERSITY  
COOPERATIVE EXTENSION SERVICE

MULTI-STATE, MULTI-INSTITUTIONAL, MULTI-DISCIPLINE ACTIVITIES

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
1	268,256	268,256
2	213,027	213,027
3	110,458	110,458
4	94,679	94,679
5	102,569	102,569
<i>TOTAL</i>	788,989	788,989

Note: A total of 25% of Smith-Lever funds will be used to address "Multi" activities.



SOUTH DAKOTA STATE UNIVERSITY  
AGRICULTURAL EXPERIMENT STATION  
MULTI-STATE, MULTI-INSTITUTIONAL, MULTI-DISCIPLINE ACTIVITIES

<u>Goal</u>	<u>FY05</u>	<u>FY06</u>
1	471,861	471,861
2	32,407	32,407
3	15,643	15,643
4	20,331	20,331
5	41,011	41,011
<i>TOTAL</i>	<i>581,253</i>	<i>581,253</i>

Note: 25% of Hatch funds will be used to address “Multi” activities.

***For a detailed listing of SDSU’s Multi-Institutional, Multi-Disciplinary, Multi-State and Integrated Activities, please refer to the attached document in the FY2000-2004 Plan of Work***

Target Audiences:

Each of the five goals in this Plan of Work contains specific descriptions of target audiences, including under-served sectors of the population. South Dakota State University strives to assure that under-served sectors of the population have a role as stakeholders in requesting educational programs, and also in receiving educational programs. In general, under-served sectors of the population may include but are not limited to: the Native American population, geographically disadvantaged, and in certain cases, specific income or age groups.

Plan of Work Budget

*Note: This budget includes only Smith-Lever 3b-c, Hatch and State funds, as required by CSREES Plan of Work Guidelines. Federal restricted or special project funds are not included.*

Goal	Projected <u>Total</u> Resources	
	FY05	FY06
1	5,666,145	5,666,145
2	3,065,918	3,065,918
3	636,610	636,610
4	635,791	635,791
5	963,165	963,165
<b>TOTAL</b>	<b>10,967,629</b>	<b>10,967,629</b>

Goal	Projected <u>Federal</u> Outlays	
	FY05	FY06
1	2,791,751	2,791,751
2	1,598,321	1,598,321
3	338,267	338,267
4	316,708	316,708
5	435,920	435,920
<b>TOTAL</b>	<b>5,480,967</b>	<b>5,480,967</b>

Goal	Projected <u>State</u> Outlays	
	FY05	FY06
1	2,872,394	2,872,394
2	1,467,597	1,467,597
3	298,343	298,343
4	319,083	319,083
5	527,245	527,245
<b>TOTAL</b>	<b>5,484,662</b>	<b>5,484,662</b>

Goal	Projected <u>FTE'S</u>	
	FY05	FY06
1	210.04	210.04
2	71.94	71.94
3	14.15	14.15
4	23.36	23.36
5	50.52	50.52

Equal Employment Opportunity/Civil Rights Reporting:

South Dakota State University affirms the concepts and practices of equality and diversity, and is engaged in regular reporting of Civil Rights and Equal Employment Opportunity compliance. These reports are filled by the SDSU Office of Diversity and Equal Opportunity to the U.S. Department of Education. This office encompasses all entities of South Dakota State University, including the South Dakota Agricultural Experiment Station and Cooperative Extension Service.

Certification:

Fred A. Cholick  
Acting Director, SD Cooperative Extension Service and  
Dean, College of Agriculture and Biological Sciences  
South Dakota State University

Kevin D. Kephart  
Director, SD Agricultural Experiment Station and  
Associate Dean, College of Agriculture and Biological Sciences  
South Dakota State University

Please Refer to the FY 2000-2004 Plan of Work for the following supporting documents:

Appendices:

- A. Summary of Multi-Institutional, Multi-Disciplinary, Multi-State, and Integrated Activities for South Dakota State University
- B. Extension Vision for the 21<sup>st</sup> Century
- C. South Dakota Agricultural Experiment Station Project Proposal Review Form