

SOUTH DAKOTA BOARD OF REGENTS

Budget and Finance

AGENDA ITEM: 6 – I

DATE: April 1, 2020

SUBJECT

SDSU Cow Barn and Milking Parlor Preliminary Facility Statement (PFS)

CONTROLLING STATUTE, RULE, OR POLICY

[SDCL 5-14-1](#) – Classification of Capital Improvements

[SDCL 5-14-2](#) – Supervision by Bureau of Administration of Capital Improvement
Projects – Payment of Appropriated Funds

[SDCL 5-14-3](#) – Preparation of Plans and Specifications for Capital Improvements – State
Building Committees – Approval by Board or Commission in Charge of
Institution

[BOR Policy 6:4](#) – Capital Improvements

[BOR Policy 6:6](#) – Maintenance and Repair

BACKGROUND / DISCUSSION

SDSU requests approval of this Preliminary Facility Statement for planning a replacement cow barn and milking parlor and the renovation of the existing cow barn and milking parlor at the Dairy Unit of the SDSU Agricultural Experiment Station. SDSU further requests appointment of a building committee member and that consultants be selected and retained to provide architectural programming and schematic design services for planning this project.

The SDSU Dairy and Food Science Department lies in the heart of one of the fastest growing dairy regions in the country, widely known in the dairy community as the I-29 corridor. The department has global recognition for its strong teaching and research programs, drawing undergraduate and graduate students from 15 states and at least 10 countries. SDSU Dairy Science graduates hold leadership positions in the industry and the demand for well-trained graduates and contemporary research in dairy science continues to expand.

(Continued)

DRAFT MOTION 20200401_6-I:

I move to approve SDSU’s Preliminary Facility Statement and to assign a building committee for the planning of a new cow barn and milking parlor along with the renovation of the existing facilities.

The existing production facility is now outdated and is no longer able to support the anticipated growth of the industry. Average commercial herd size has increased from 60 cows to approximately 500 in the last 15 years. Milk production per cow has increased from an average of approximately 12,000 to 24,000 lbs. per year. The department has collaborated with national industry leaders and identified future teaching and research needs in herd management, nutritional efficiencies, understanding of robotic systems, and others. The Dairy and Food Science Department has a strong record of partnership with the dairy industry for addressing these needs but is handicapped by outdated milk production facilities.

This project is consistent with capital projects identified for SDSU and is one of the projects specifically noted as a future capital improvement in the 10-Year Capital Improvement Project List.

Funding

The SDSU Dairy Facility project and renovation will be funded from donations and gifts.

IMPACT AND RECOMMENDATIONS

The Dairy Unit and new facility will function as a production dairy farm, milking facility, office for faculty and production staff, teaching unit for undergraduate and graduate students, and research support facility for dairy science. The primary constituents using the building will be faculty, staff, and students in Dairy Science. A wide range of classes serving up to 150 students could utilize the new facilities.

Classes will include Dairy Science (Dairy Production), Animal Science, Dairy Cattle Evaluation, Veterinary Science (especially for the new Vet 2+2 program), Animal Diseases and their Control, Ag Engineering, and Precision Agriculture classes pertaining to livestock precision agriculture. Graduate students will also utilize the facility for research. In addition, the facility will also cater to an additional 100 K-12 students each year that will be involved in dairy cattle showing and handling through FFA, 4-H, and Little I events. It is anticipated that the facility will attract students from surrounding states for dairy education as no other university has integrated programs that comprehensively cover the entire spectrum of dairy from farm to product. A particularly important aspect of the facility will be the implementation of current technologies in milk production such as robotic milking and sensor technologies for herd management.

ATTACHMENTS

Attachment I –SDSU Cow Barn and Milking Parlor Preliminary Facility Statement

PRELIMINARY FACILITY STATEMENT
FOR
REPLACEMENT/RENOVATION OF
THE DAIRY RESEARCH & TRAINING FACILITIES
SDSU - AGRICULTURAL EXPERIMENT STATION – DAIRY UNIT
SOUTH DAKOTA STATE UNIVERSITY

DATE: February 29, 2020

SDSU requests approval of this Preliminary Facility Statement and companion OSE work request for planning a replacement cow barn and milking parlor and renovation of the existing cow barn and milking parlor at the Dairy Unit of the SDSU Agricultural Experiment Station. We request appointment of a building committee and that consultants be selected and retained to provide architectural programming and schematic design services (planning only) for this project.

A. GENERAL PROGRAMMATIC NEEDS TO BE ADDRESSED:

The SDSU Dairy and Food Science Department lies in the heart of one of the fastest growing dairy regions in the country, widely known in the dairy community as the I-29 corridor. The department has global recognition for its strong teaching and research programs, drawing undergraduate and graduate students from 15 states and at least 10 countries. SDSU Dairy Science graduates hold leadership positions in industry and the demand for well-trained graduates and contemporary research in dairy science continues to expand.

In spite of the strong and growing needs, other universities in the region do not offer programs that address them, creating an opportunity for SDSU to further strengthen its role in the dairy field by helping generate new knowledge and highly competitive human capital for the dairy industry and its future.

To support this, a state-of-the-art dairy production facility with the capability of providing contemporary education and leading-edge research is essential. The existing facility was designed for dairying of the 1990s, and after completion contributed to SDSU efforts to become a world leader in dairy cattle nutrition research. Research conducted at SDSU on distillers' grains and whey for dairy cattle rations is now widely applied in the industry.

The existing production facility is now outdated and is no longer able to support the anticipated growth of the industry. Average commercial herd size has increased from 60 cows to approximately 500 in the last 15 years. Milk production per cow has increased from an average of approximately 12,000 to 24,000 lbs. /year. Substantial advances in feeding, breeding, labor management, finance management and record keeping have taken place. The department has collaborated with national industry leaders and identified future teaching and research needs in herd management, nutritional efficiencies, understanding of robotic systems, and others. The Dairy and Food Science Department has a strong record of

partnership with the dairy industry for addressing these needs but is handicapped by outdated milk production facilities.

To expand and strengthen this program and continue to be relevant, it is essential to build a new dairy research and training facility that will house a minimum of 500 milking cows and be flexible and expandable to provide opportunity for future industry needs. The new facility will be equipped with state-of-the-art milking, feeding, breeding, and management capabilities designed to provide hands-on training for students, and research and service relevant to the industry.

Three faculty members with specialization in various aspects of dairy cattle nutrition and management, a farm manager and an Extension Specialist will be dedicated to fulfilling these missions. Students will receive training through employment and hands-on class work involving current practices in dairy production. Research directly relevant to large herds will be conducted in the areas of nutrition, management, and possibly breeding. The facility will also enable us to provide specific training to industry (e.g. milk quality, feeding practices and other areas).

SDSU's track record in the dairy field is well recognized: the Davis Dairy Plant that was opened in 2011 at SDSU is already helping develop future industry leaders in dairy processing. A large new international cheese plant was established in Brookings due to this progressive industry. SDSU's strong dairy program was a factor in this industry leader's decision to locate in Brookings. As a result, this international plant employs approximately 10 SDSU alumni in high level positions and continues to seek more. The program provides education and thus trained personnel for many manufacturers in this region. Building a new Dairy Research and Training Facility will create similar opportunities for Dairy Production students and together with the Davis Dairy Plant will enable a strong, impactful integrated program that will be a catalyst for the South Dakota dairy industry of the future.

B. ANALYSIS OF THE STUDENT BODY OR CONSTITUENTS TO BE SERVED:

The Dairy Unit and new facility will function as a production dairy farm, milking facility, office for faculty and production staff, teaching unit for undergraduate and graduate students, and research support facility for dairy science. The primary constituents using the building will be faculty, staff, and students in Dairy Science. A wide range of classes serving up to 150 students could utilize the new facilities.

Classes will include Dairy Science (Dairy Production), Animal Science, Dairy Cattle Evaluation, Veterinary Science (especially for the new Vet 2+2 program), Animal Diseases and their Control, Ag Engineering, and Precision Agriculture classes pertaining to livestock precision agriculture. Graduate students will also utilize the facility for research. In addition, the facility will also cater to an additional 100 k-12 students each year that will be involved in dairy cattle showing and handling through FFA, 4-H and Little I events. It is anticipated that the facility will attract students from surrounding states for dairy education as no other university has integrated programs that comprehensively cover the entire

spectrum of dairy from farm to product. A particularly important aspect of the facility will be the implementation of current technologies in milk production such as robotic milking and sensor technologies for herd management.

C. ADDITIONAL SERVICES TO BE OFFERED:

The newest equipment and technology in feed delivery & management, robotic milking, sensor technology for herd management, raw milk storage, and animal care will need to be incorporated in the facilities. Technology for reporting and monitoring all activities will be needed.

On site classroom and conference space will be provided that do not exist in current facilities. In addition to these spaces, the facility would be designed for extension and public visitation. Classroom technology for audio/video conferences and presentations will be required in classroom, conference, and office facilities. The facility will need to be networked to the campus technology and so information may be shared directly with researchers and faculty members. All spaces, including production and milking facilities will require networking to campus facilities.

The herd size will be increased from its current size to a level close to the average commercial herd size. The current production facility provides milk products to campus dining services as well as through retail sales from the Dairy Bar.

D. COMPLIANCE WITH CAMPUS MASTER PLAN:

This project is consistent with capital projects identified for SDSU and is one of the projects specifically noted as a future capital improvement in the 10-Year Capital Improvement Project List.

E. ANALYSIS OF NEEDS ASSESSMENT BASED ON THE FACILITIES UTILIZATION REPORT:

Space needs will include a new free stall cow barn and accompanying milking facilities for a herd of approximately 500 cows. Spaces with the new barn will include a robotic milking parlor, milk storage room, utility room, locker facilities, a free stall barn, calf barn, transition & dry cow housing, pump house, and animal holding area. Possible tertiary support spaces include scale & processing area, animal handling equipment and space, 'calf hospital', colostrum processing area, cleaning and equipment space, feed storage or feed 'kitchen', locker facilities, break room, and wash down research lab.

Spaces for supporting education and extension include classroom/conference space(s), cattle judging area, viewing areas, observation space, and laboratory space. Viewing and observation spaces will require independent access. Spaces for supporting research will be required, including office space, a research support lab, feeding and bedding support facilities, and veterinary office. The facilities will need to be flexibly designed to allow continual application of new technologies and trial of new equipment and methods as they develop.

F. LOCATION:

The project will be at the site of the current Dairy Research and Training Facility, one of the SDSU Agricultural Experiment Station farms north of the main SDSU campus and within easy reach of students, researchers, stakeholders and visitors. The proximity to the main SDSU campus also affords the opportunity to incorporate classroom activities, similar to the new Swine Research & Teaching Unit and the Cow-Calf Teaching & Research Unit.

The site offers the possibility to reuse or renovate existing facilities that can continue to serve the needs of the Dairy Science programs. Part of the conceptual planning will be to assess the condition, necessary repairs, and potential of existing facilities to support a modern dairy research and production operation. Storage facilities, machine sheds, repurposing the current milking barn into a calving facility, and use of the waste management lagoon are examples of existing structures that have potential reuse with proper modifications.

The site has available utilities that can be extended or replaced to serve new facilities. Water service, electrical, sanitary sewer, and natural gas utilities will be evaluated and extended or replaced from their source point. The electrical transformer for the Dairy Unit will be examined for age and reliability. Gravel service drives will be extended to serve the new facilities. Some existing facilities would be demolished (e.g. the 1960 barn, office facility, and some support facilities) as they are no longer able to properly support activities on the site.

G. REALLOCATION OF OLD SPACE, IF ANY:

The planning services desired will allow the University to make decisions as to the amount of new space required and if any existing space could be repurposed. The planning services will also identify whether retention or demolition of existing facilities is preferred. These services would also identify repairs or renovations needed within existing facilities for dairy production, education, or research.

H. PROPOSED FUNDING SOURCE/SOURCES:

The project will be funded from donations and gifts made towards the project.

I. BUDGET FOR DEVELOPMENT OF A FACILITY PROGRAM PLAN:

We estimate architectural programming and conceptual design services will cost approximately \$150,000. This will provide services necessary to develop the architectural program, develop a schematic design, and estimate project costs. We also expect to develop materials that can be utilized for fund raising and explanation of the project.

End of Report: February 10, 2020