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Knowledge to Go Places



YoVé: WSU Dairy Product Development Team Success

Niche marketing of specialty dairy products has become an intriguing source of income for the dairy industry. A valuable source of innovative product ideas can be found at certain land grant universities where a team of students formulate products as part of college studies. This spring Washington State University's Dairy Product Development Team developed an award winning hit: YoVé, an all natural, lowfat yogurt with dairy ingredients, probiotic cultures and stabilizers which are blended with vegetable purees; a unique product for health-conscious individuals.

YoVé tied with Mocha Royale, the entry from North Carolina State University for "Most Marketable Product" in Dairy Management, Inc.'s Discoveries in Dairy Ingredients competition this spring. YoVé was also selected as one of 6 finalists in the Institute of Food Technologists (IFT) Product Development Competition sponsored by M&M Mars. This is the third time WSU has submitted a product, but the first time that WSU has been selected to advance in the prestigious IFT competition.

In June the team consisting of graduate and undergraduate students in 3 different university specialty areas presented their product to a team of judges as well as to 18,000 general attendees of the IFT meeting in Anaheim, CA. YoVé did not receive one of the top three awards, but the WSU team, the only from a western state, represented the university and western dairy industry well. The top three awards went to North Carolina State University for Mocha Royale, coffee dairy creamer on a stick; Michigan State University for Tapa Twists, a hot handheld appetizer, and Purdue University for Hash-n-Dash, their deep-fried potato and egg breakfast dish. The other finalists besides WSU were from Rutgers University and University of Maryland.

Stephanie Clark, assistant professor and one of the advisors for the WSU team, said the team considered patenting the product but were advised that it would not qualify since the ingredients and processes are not unique, only the formulation. At present no one has contacted the students about pursuing commercial manufacturing of YoVé but they certainly would be interested in a collaboration. To find out more about YoVé contact Dr Stephanie Clark by e-mail stephclark@wsu.edu or visit her website <<http://av.fshn.wsu.edu/faculty/clark/index.html>>.

Regardless of the future of YoVé, the WSU Dairy Product Development Team will continue to provide students with an experience that promotes the development of independent thinking and innovation. Each year the team works on one or two new products and takes part in the competitions which challenge team members to develop innovative product formulations. New ideas are generated in the field of foodscience and a few ideas are shortlisted to be carried forward. The Dairy Product Development Team provides an opportunity to help students gain the skills needed to succeed in the food industry. The team is a mix of both graduate and undergraduate college students from diverse fields. A psychology student interested in sensory evaluation may work with a finance major student interested in costing of launching new product!

Students on the WSU team that produced YoVé include graduate students: Shantanu Agarwal (food science); Sarma Manurung (food science); Lisa Pitka (food science); Terri Nolan (psychology); Kirti Sharma (food science); Elly Soeryapranata (food science) and undergraduate students Charis Groot (food science) and Todd Nolan (finance). The team advisors were Dr. Stephanie Clark and Dr. Lloyd Luedecke.

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Challenges and Opportunities in Dairy Education

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The dairy industry continues to thrive across the region and the country. This is not to say it is not without the usual problems and challenges. Fluctuating prices, rising costs, bad weather, good weather, cow problems, labor problems, consumer problems—just like every other industry, the Dairy industry lives in the real world. Our challenge in education is to recruit and train smart, enthusiastic, able, positive, adaptable young people to be workers, managers and leaders in the industry. As the number of dairy farms continues to drop while cow numbers are steady and production increases, there is changing demand for the college graduate. The ‘old norm’ of the farm child going off to college to come back to run the farm is now rare. For one thing, there are not enough young people on farms to supply the need! For another, the dairy industry now encompasses nutritionists, feed company representatives, pharmaceutical representatives, veterinarians and marketing specialists. The demand for top support and specialization people such as these has not diminished. We are constantly called for students who have experience and training to deal with today’s dairy problems. But the majority of the calls now are from dairy related companies and not dairy owners.

In the Western United States several Land Grant Schools still train students for careers in the dairy industry. At **University of California (Davis)**, they have hired a new air quality specialist, and are in the planning stages of a new research and teaching dairy. Their students can be a herd manager intern at the dairy and are encouraged to get other internships as well. At **Utah State University**, they have a teaching and research dairy, an animal biotechnology center, and a cooperative research program with the Food Science Department to study from ‘farm to table’. In the Dairy Products Technology Center at **California Polytech (San Luis Obispo)**, they are training students and doing research in all phases of dairy production and foods. At **Colorado State University (CSU)**, students intern at cooperating dairies or with other dairy industry specialists. CSU also has developed the Integrated Livestock Management program (ILM, see below) which integrates teaching, research and producer service activities. At **Oregon State University**, they are starting up a student experience program similar to **Washington State University’s** Cooperative University Dairy Students (CUDS) program (see below).

At WSU, we try to rise to the challenge in many ways. The first is in recruiting. We cannot rely on the expectation that students from dairy areas will come to WSU, get an education and stay in the industry. There are fewer of these students, and those that do come to college often come to ‘get out’ of the dairy industry. It’s tough for a college professor to convince a young person to stay in the industry when Mom and Dad are telling them to get out. So we recruit from a large body of students from all backgrounds. Certainly over the last ten years we have put more graduates into the industry than have come from it. It must also be stressed that the dairy veterinarians come out of these undergraduate programs as well, and Animal Science Departments work closely with Colleges of Veterinary Medicine to supply well-trained students. Although budgets fall and faculty leave or change, we maintain a strong core of dairy and dairy related classes. We work closely with the dairy faculty at University of Idaho in both research, sharing facilities and in teaching dairy classes. We encourage and help students to get internships in the industry. Dr. Larry Fox advises the WSU Dairy Club. John Swain, WSU Dairy Manager, works with students on practical aspects, including management, dairy judging, and the new “Dairy Challenge” program. This program was set up by major agricultural companies in the US. A team of 4 students and one alternate from each of 14 land grant universities prepared throughout the year by intensively studying the practical evaluation and management of dairy enterprises. WSU and UI students and coaches worked together throughout the training. In March, the first “Dairy Challenge” Competition was held in Michigan. The contest allowed one hour to tour the dairy, 15 minutes interviewing the manager, time to write up an in-depth evaluation, and then present it to the judges, who included top officers in major companies. What an experience! This is the dairy education of the future, as is experienced by participants in Dairy Discussion Groups.

A joint venture is underway between WSU and UI to combine their small herds into a larger modern research and teaching dairy. It would provide more practical opportunities for internships, run a larger CUDS program, do current issue-based research related to both large and small dairies, as well as meet industry’s needs in all aspects of animal management. Working cooperatively with dairy associations and allied industry is the only way to ‘make it happen’ in this time of anti-agricultural budgetary prioritization. WSU’s Dr. Joe Hillers is coordinating the effort and would love to hear from you.

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Tips to Decrease the Average Age at First Calving in Your Herd

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According to records processed at DHI Provo, the average age at first calving is greater than 25 months for western dairy herds. The cost of one month beyond 24 months of age may be estimated at \$60.00 per heifer. With an annual replacement rate of 38%, a *minimum* of 38 heifers (per 100 cows) must calve each year to maintain herd size. If you assume a 15% increase is necessary to cover death loss, infertility, and selection within the heifer pool, then 44 heifers (per 100 cows) must calve each year. Therefore, an average age at first calving of 25.3 months translates into an extra expense of \$3,432 (per 100 cows in the herd) (Table 1). For a herd with 1,000 lactating cows, this translates into an extra expense of \$34,320.

Table 1. An example of the cost associated with an average age at first calving of greater than 24 months.

Average age at first calving	25.3 months
Goal for average age at first calving	24 months
Additional months past goal	$25.3 - 24 = 1.3$ months
Cost for additional months past goal	$1.3 \text{ months} \times \$60.00 = \$78.00$
Annual replacement rate	38%
Number of heifers needed annually (per 100 cows)	44
Additional cost (per 100 cows) associated with an average age at first calving of 25.3 months	$\$78.00 \times 44 = \$3,432$

Here are a few tips to help increase profitability by decreasing the average age at first calving in your herd.

Colostrum quality and quantity are the foundation of a good heifer management program. The first feeding of colostrum is critical to the transfer of immunoglobulins. Check colostrum quality with a colostrometer to ensure adequate levels of immunoglobulins are present. Provide 1 gallon of “good” colostrum within two hours of birth, and an additional gallon within the first 24 hours after birth. Consider freezing excess “good” colostrum for feeding to calves born from dams with inadequate colostrum quality. To aid in controlling Johne’s disease, do not allow calves to nurse and only utilize colostrum from Johne’s test-negative cows.

All dairy producers should set realistic goals (Table 2) and monitor the progress of their heifers regularly. Milk production during the first lactation is directly related to the weight, height, and body condition of the heifer at first calving, *not the age*. Therefore, a 24-month-old heifer that achieves the goals shown in Table 2 will produce more milk and attain profitability earlier in her lifetime than heifers that calve later.

Consult a nutritionist to provide expertise in ration balancing and growth monitoring. If a Holstein heifer weighs 100 lb at birth, then the animal must gain an average of 1.8 lb per day to reach the goal of calving between 1,350 to 1,400 lb at 24 months of age. Average daily gains of greater than 2.0 lb per day before puberty have been shown to lead to increased fat deposition in the mammary gland, resulting in decreased milk secretory tissue. Consequently, decreased milk production has been reported in heifers that gained greater than 2.0 lb per day before puberty compared to heifers that gained less than 2.0 lb per day before puberty. Monitoring growth of heifers using a scale or weigh tape is critical, as well-managed heifers may grow faster than expected. Under poor management, heifers may grow slower than predicted.

Heifers will attain puberty at 40 to 50% of mature weight and should be bred based on size (weight) rather than age. If a Holstein heifer gains approximately 1.8 lb per day, 800 lb will be reached by 13 months of age. Heifers that gain weight faster than expected and attain the proper size for breeding at 10 to 11 months of age should be bred
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(Heifers, continued from page 3)

because delayed breeding will lead to overconditioning. The nutritional program should be adjusted to reduce average daily gains prior to puberty, keeping in mind that calving prior to 22 months of age leads to decreased milk production compared to heifers that calve between 22 and 24 months of age.

Table 2. Suggested goals for Holstein heifers.

Weight at first breeding	800 lb
Age at first calving	22 to 24 months
Weight at first calving	1,350 to 1,400 lb
Weight after first calving	1,250 lb
Height at first calving	≥ 54 inches
Body condition score at first calving	3.25 to 3.5

(Adapted from Vandehaar, 2001).

Recognize the effects of heat detection and conception rate on age at first calving. If your heat detection efficiency is 50% and your conception rate is 50%, then at least four estrous cycles will be required to get the average heifer pregnant. If you start breeding at 800 lb and 13 months of age, the average heifer in your herd will not conceive until almost 16 months of age and not calve until 25 months of age. Focus on increasing the heat detection efficiency and conception rate to reduce the average age at first calving. Utilize an estrous synchronization protocol to ensure greater heat detection and AI labor efficiency.

Recognize the limitations and dangers of using natural service bulls. Recognize the costs of natural service, which include the purchase price of the bull, daily feed costs, veterinary costs, and lost income because the daughters of natural service bulls will produce less milk than the daughters of AI sires. Venereal diseases such as *campylobacter fetus* (previously called *vibriosis*) and trichomoniasis can be devastating to your herd's profitability as heifers may become infected during natural service, abort, and become either temporarily or permanently infertile. Utilize AI on your heifers to avoid these problems and realize the financial benefits of genetic advancement made possible by proven AI sires.

Pregnancy check heifers before 40 days after AI. This strategy allows management to focus on heat detection of confirmed open heifers that will be coming into heat in a few days, thus minimizing the potential increase in average age at first calving due to inefficient heat detection.

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At WSU we also continue our popular Cooperative University Dairy Students (CUDS) program. Twelve students own and operate a 35-cow dairy with replacements. They do all the work except lot scraping and feeding the TMR. They make all the business and animal decisions. Graduates of this program own or manage dairies as well as become leaders throughout the dairy industry. We are unable to fill all the requests for graduates of this program.

At CSU the Integrated Livestock Management Program (ILM) is a collaboration between the Colleges of Agriculture and Veterinary Medicine. The primary focus has been advanced training of graduate students in a program that integrates teaching, research, and producer service. Student projects are designed to investigate producer problems as the basis of research and training. Students work directly with cooperating producers so that they understand the production environment and are prepared to develop practical and workable solutions to real-life problems. ILM also emphasizes the importance of producer education and has begun developing a program for farm worker training. Information about the ILM program is available on the web at www.cvms.colostate.edu/ilm/.

We encourage students to join these programs to round out their education and get the experience they need to be a moving force in the industry. Please encourage 'dairy kids' and other enlightened youth to check into the new exciting opportunities. Be sure high school counselors, 4-H and FFA leaders, and dairy families are aware of these university programs. We would love to help prepare these talented youth to be leaders in the dairy industry of the future.

Western Dairy News is published as a service to the people interested in the health and welfare of the western dairy industry. Archives of this publication may be found at <http://animalscience-extension.tamu.edu/dairy/wdn/wdn.html>

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