

A click-and-calculate solution

New Mexico dairy specialist is developing a computer model to optimize dairy operations

By Catherine Merlo

Can a single computer application analyze your dairy's entire operation, detect its weaknesses and pinpoint which practices could be optimized?

Victor Cabrera thinks so.

Cabrera is the new dairy specialist, researcher and assistant professor at New Mexico State University's Cooperative Extension Service. He has just begun developing a computer model that will simulate a whole dairy, integrating all aspects so a producer can compare, estimate and analyze operational costs, procedures and other dairy functions.

"I am going to look at data that is common to all dairies and then represent any dairy by adjusting information," says Cabrera, who is a native of Peru. "We can see what's happening in real time at a dairy, and forecast what would happen in the whole dairy farm system when there is a change in any of its components."

The model will be based on information collected from many of New Mexico's 172 dairies.

Cabrera hopes to use a common computer application, such as Microsoft Excel, to run his computer model. With it, producers would be able to see what would happen at their dairies if they plugged in different sets of "what if" scenarios to produce alternate results. For example, how many



PHOTO: STEVE CORNETT

From the Agricultural Science Center at Clovis, N.M., Victor Cabrera (left) will produce a computer-simulated dairy model to aid New Mexico operations. Producer Art Schaap (right) is working with Cabrera to share real farm data.

cows will be calving next month? How much milk production can be expected? What results could you expect if you changed your herd's diet?

"The model will use real data," he says. "But farmers don't want to spend the whole day inputting data, so the less we ask, the better."

Cabrera has started his research with core dairy components: herd dynamics, crop system, feed and nutrition, milking parlor, and manure management. He will incorporate pregnancy and conception rates on a seasonal basis,

factoring in the age and stage of each group of cows.

While he plans to include all >>

Simulating a dairy

- ◆ The program will help producers compare, estimate and analyze operational costs, procedures and other dairy functions.
- ◆ The model may use programs like Microsoft Excel so producers can plug in "what if" scenarios.
- ◆ For further information, visit <http://dairy.nmsu.edu>.

aspects of a dairy in the computer model, Cabrera will concentrate on the need for more information on environmental concerns.

"Dairy farmers are required to comply with an ever-changing and not always well-defined set of regulations," he says. "They'd like to see ways to demonstrate to the regulatory agencies what the real situation is based on real facts."

Cabrera will need two to three years to complete his computer simulation of dairies. By then, he says, producers should have "a very nice application that's been calibrated and validated."

Even so, he expects the model to be a work in progress, one that can be updated and tweaked if new components need to be integrated.

Producers won't be charged to

use the computer application. "It's part of the Extension program here," Cabrera says.

"As far as I know, no others are doing computer simulation of the whole dairy farm system, integrating all parts," he adds. "It's a collaborative effort, and I will need the help of many people for providing information feedback, and perhaps some funding."

Cabrera is working with the Dairy Producers of New Mexico, a trade association that represents New Mexico and West Texas dairies. The group is helping Cabrera reach producers to gain as much real data as possible.

Cabrera is also working on an Web site (<http://dairy.nmsu.edu>) that would include a variety of information of interest to dairy

producers, such as events, literature on current issues, and training materials.

As a research student at the University of Miami, Cabrera developed farm simulation models that used optimization methods to evaluate the value of climate forecasts under different government farm program scenarios. **EP**

Model's environmental focus welcome

For dairy producer Art Schaap, a computer model that can help boost his monthly cash flow is worth exploring.

"This would be an asset for dairy farmers," Schaap says. "At the end of the day, what matters is how much cash is left to pay the bills. If you're in a growth mode, there may not be much cash left over."

Schaap and his Highland Dairy near Clovis, N.M., are one of the operations providing information for Victor Cabrera's computer modeling project. Along with the Highland Dairy, Schaap operates two other dairies in Clovis and Portales, N.M. Together, the three operations milk 5,400 cows.

Schaap is excited about New Mexico State University and Cabrera working together on a computer model for the benefit of dairy farmers.

As a member of Dairy Producers of New Mexico's Environmental Task Force Committee, Schaap is especially interested in Cabrera's goal of compiling environmental regulations, management practices and pending changes for his computer model. Like his fellow producers, Schaap is frustrated with policy changes made by New Mexico's legislature every five years, which results in new environmental regulations that are often based on "feelings," not science.

"With the research that Dr. Cabrera will be doing, we can put science behind the policies to prove we don't need new regulations," Schaap says. "We need to rely on our colleges to prove that dairy producers are doing a sound job of taking care of dairies."

New Mexico: Dairy powerhouse

New Mexico offers plenty of opportunities for Victor Cabrera's dairy research.

Its \$1.1-billion-a-year dairy industry is the most important agricultural industry in the state, generating more revenue than any other farm activity.

Among its dairy strengths:

- ◆ New Mexico boasts the nation's largest average herd size at 2,000.
- ◆ Nationwide, New Mexico is seventh in milk production and eighth in cheese production.
- ◆ The state's milk production rose 33% and its number of cows jumped by 30% just in the last five years. In May 2006, the state saw 16.1% growth in milk production—the highest in the nation.
- ◆ New Mexico also holds the No. 7 spot in total number of cows, with 340,000 lactating animals. The state's cows produce an average of 21,192 lb. of milk annually.
- ◆ Seventy-five percent of New Mexico's milk volume is produced in the eastern part of the state, which is predominantly in Chaves, Roosevelt and Curry counties.