High-yielding cows are more efficient and profitable

by Israel Flamenzbaum

With the current economic situation facing many dairy sectors around the world, obtaining high per cow yields may be a way to improve production efficiency and farm profitability. In order to dig a bit deeper into this concept, a comparative survey was conducted to examine the trends on 40 large-scale dairy farms from 1991 to 2011. The operations were located in the Yizrael Valley, a warm region in the northern part of Israel.

The study was performed at the end of each year to obtain similar snapshots when evaluating data from year to year. To further streamline the data, the analysis was performed by the same person who happened to be a senior regional dairy economist.

The purpose of this study was to analyze the parameters that influence farm performance and profitability. The evaluation took into account the major expenses such as feed, labor, materials and other services along with the major income sources such as milk, meat and manure, a valuable fertilizer in Israel.

Based on this data, the feed efficiency was calculated for each farm. While feed efficiency was measured by kilograms of dry matter (DM) per liter of milk produced, we converted the measure to pounds for this article. For an apples-to-apples “between years comparison” and financial analysis, data for all the 20 years was capitalized to the end of 2011.

The profitability index was tested in terms of “net income per liter of milk produced” and was calculated as the difference between total income and expenses per liter of milk produced. As mentioned before, we converted net income to pounds of milk produced for North American readers. The study did not take into account the cost of capital and general administrative expenses.

**Milk surpassed components**

Per cow annual milk production in the 20 years studied rose by 5,180 pounds (25 percent, see Figure 1). In the same period, milk protein and fat content improved by 8 percent and 17 percent, respectively.

The study researchers found that only 30 percent of total production gains can be related to genetic progress, while 70 percent of the improvement is related to environmental progress which mainly includes feeding and management practices.

Feed efficiency (pounds of dry matter per pound of milk produced) was calculated for every dairy farm in each of the 20 years studied. Efficiency was calculated based on pounds of milk as well as per pound of “energy corrected milk.”

During the 20 years studied, feed intake (pounds DM/cow/day) rose by 13 percent, while milk yield (pounds/cow/day) grew by 25 percent, a 12 percentage units improvement per pound of milk.

In terms of “energy corrected milk,” the improvement was even greater and reached approximately 15 percentage units. The correlation between production efficiency and milk yield was very high, and in terms of “energy corrected milk,” it was close to 1. The improvement in feed efficiency for “energy corrected milk” averaged 0.8 percentage unit per year during the studied period.

Results of the study indicate that dry matter required for milk production dropped from 0.83 to 0.75 pounds per pound of milk, while cows’ annual production grew from 20,500 to 26,100 pounds, a 10 percent improvement in feed efficiency. In terms of “energy corrected milk,” the improvement in feed efficiency was even greater with a reduction of feed to milk requirement from 0.87 to 0.73. That represents a 15 percent improvement in feed efficiency (see Figure 2). As we all know, feed prices, particularly grains, have exploded in the past years, so these returns on feed should be welcomed news for all dairy producers.

**More valuable cows**

Based on the study results, I calculated the economical value of reaching higher per cow yields. To calculate this value, I compared the cost of feeding for milk production between cows producing 20,500 and 26,100 pounds per year, with an improvement of 10 and 15 percentage units in feed efficiency. According to this calculation, the improvement of 5,600 pounds in annual production yielded an additional income per cow of $290 and $440 based on U.S. currency and feed prices, when feed efficiency was enhanced by 10 and 15 percentage units, respectively.