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Energy Savings Through Higher Producing Cows

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During these days of critical supplies of fossil fuels all people are making efforts to conserve fuel. Dairy operators can save fuel by minimizing waste, reclaiming heat from the milk produced (by transferring it to water through a heat exchanger), and by cutting feed requirements.

The possibility of saving fuel by using less feed, both forage and grain, has received little attention. It takes about 5 gallons of diesel or gasoline to produce a ton of barley, and about 4 gallons to produce a ton of alfalfa, not including fuel used to transport feed from its production site to the dairy farm.

At first thought, using less feed seems inconsistent with good nutrition, but let's look at some data from research done at the University of California-Davis (Table 1).

Table 1. Effect of Level of Production on Efficiency of Production.

Amount of milk produced	Amount of feed[1] (dry matter basis)	Amount of milk per pound of feed	Gross energy efficiency[2]
	Pounds	*Pounds*	*Percent*
24,241 pounds	12,896	1.88	42.1
15,310 pounds	10,256	1.49	33.9
10,054 pounds	8,708	1.16	26.7

[1] All cows were fed a mixed diet of 60 percent grain, 40 percent forage.

[2] Gross energy efficiency = energy in milk ÷ metabolizable energy intake.

High-producing cows (those producing the most milk) eat more than low producers, but they produce 62 percent more milk per pound of feed. In other words, well-fed, high-producing cows save feed and the energy used to produce it compared to lower producers because you can produce the desired amount of milk (such as your marketing quota) with *fewer* cows. Also, high production under the given environmental and feed conditions will make the owner more money with less work. This does not mean that cows should be fed and managed for the most production with the least possible feed, because this might exclude low-priced, byproduct feeds from the ration. Byproduct feeds, such as cannery waste, often save both money and fossil energy.

These data apply to the individual dairy producer who is willing to reduce a herd from 100 cows producing 15,000 pounds of milk to 88 cows producing 17,000 pounds of milk. The maintenance feed cost of 12 cows has been eliminated, as well as the feed necessary to produce 15,000 pounds of milk, and the remaining cows are fed an additional amount to raise production 2,000 pounds. Table 2 shows the balance in energy for this adjustment.

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Table 2. Feed Adjustments Necessary to Produce 1.5 Million Pounds of Milk per Year with 88 Cows Instead of 100 Cows.

Feed saved	Total TDN	Amount of feed (65% TDN)
	Pounds	*Pounds*
Feed saved by eliminating 12 14,000-pound cows, each producing 15,000 pounds milk	97,732	150,357
Extra feed needed for 88 cows each producing 17,000 pounds milk	53,504	82,314
Net saved	44,228	68,043

Table 2 shows a net savings of 34 tons of feed. If this consisted of a mixture of half barley and half alfalfa, the savings in gasoline or diesel would be 153 gallons for feed production alone. Add to this the advantages of fewer cows to milk, fewer calves and heifers to raise, and less manure and waste to remove, and the total savings are substantial.

It appears that a dairy operator can improve income, with less investment in cows and less physical work.

The following management steps are necessary to produce 17,000 pounds of milk per cow.

• Records are essential to manage any business, and particularly a large dairy. Dairy Herd Improvement Records can tell the dairymen which cows to cull, when to breed, if cows become pregnant when bred, and other necessary management data. Few people can keep this kind of information in their head for 80 to 100 cows. Besides showing the present status of the herd, records encourage operators to set goals for some future date. Technical help is available to help reach these goals.

• Feeding balanced rations is essential to high, economical production. Consider using a computer program such as the one available through the Oregon State University Extension Service to calculate rations. Computers do this fast, accurately, and at low cost. It is just as important not to overfeed dry cows and cows late in lactation as it is not to underfeed fresh, high-producing cows.

• Udder health or the control of mastitis is essential to economical production. Mastitis can reduce milk production as much as 25 percent, thus wasting feed and labor. Many cows are culled because of mastitis. The California mastitis test (CMT) is a simple cow-side test that indicates udder health. The results can be recorded on your DHIA records. It will pay dairy operators to have a professional thoroughly check the milking equipment at least twice a year to make sure it is operating properly. Results of a good feeding program can be nullified by poor udder health caused by faulty equipment or faulty milking procedures.

• Breeding programs should include the use of semen from bulls with a high predicted difference (PD) for milk production and dollar income. Commercial dairy operators should put 90 percent of bull selection on production, and 10 percent on body conformation or type.

• Management is a major factor in the success of any business. Take time to develop standard procedures for recurring situations such as vaccination programs, parasite control, and maintaining or replacing equipment. This allows time to study non-recurring management decisions that will contribute to success.

In summary, high milk production per cow will lead to higher income and the satisfaction of a job well done. In addition, high production per cow allows a dairy operator to keep fewer cows and still maintain the quota or production goal. Since fewer cows will require less feed and it requires fuel to produce hay and grain, the operator has the satisfaction of reducing fuel consumption, helping to solve one of our nation's critical problems. Let's eliminate the low-producing cow.