increasing amount of grain to the ration. This seems to work so long as the amount of roughage in the ration is adequate. At some point though, the energy content of the ration becomes too high and the amount of roughage too low so that acidosis type conditions occur.

It is common knowledge that early lactating cows do not eat as much feed as they do at 2–3 months into lactation even though the level of milk production may be the same. Feed intake lags behind peak milk production by about 2–4 weeks. This results in a negative energy balance. Body reserves are mobilized to overcome the energy deficit which results in some body weight loss. Although it is normal for high producing cows to lose weight in early lactation, the energy and especially protein available from body stores can supply only a limited amount of her needs. As body fat is mobilized, proportionally more energy is available than protein. Therefore, the percent protein in the ration during early lactation should be higher in order to maximize the efficiency of energy utilization and to meet the added protein needs.

Feeding cows more liberally in early lactation reduces the period of time a cow loses body weight (Figure 1). Such a program has several advantages in that cows peak in production sooner, attain a positive energy balance quicker, and have a higher conception rate.

Cows need to be in optimum body condition to achieve maximum peak yields. For this to occur, mobilization of body reserves is essential. Each pound of body fat can provide enough energy to produce 7 lbs of milk of 3.5% fat. If cows are not in optimum body condition at time of calving (scores of 3.0–4.0), milk production may suffer. A condition score of 3.0–3.5 is recommended for first-lactation heifers and 3.5–4.0 for older cows. As body condition increases above these scores, calving difficulties may increase as well as reduced levels of milk in the subsequent lactation. The same is true for cows having lower body condition scores.

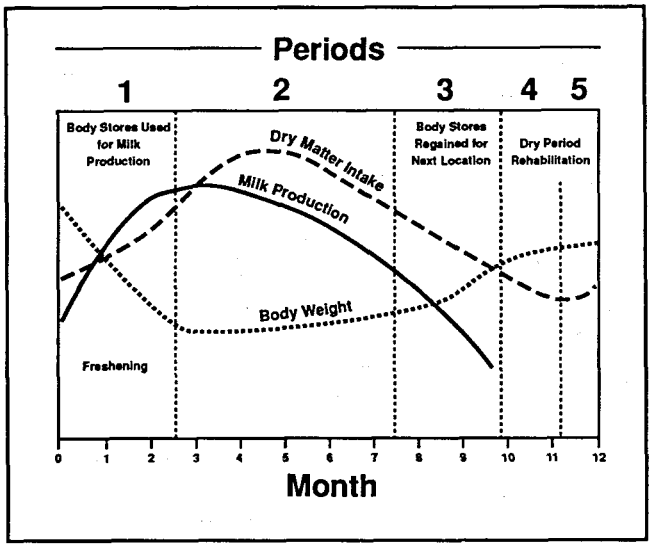

Figure 1. Dry matter intake, milk yield, and body weight changes and relationships during a lactation cycle.

Phase or group feeding is a common practice in larger dairies. It is a workable approach to feeding cows since it provides the manager an opportunity to maximize management by increasing control over the total system. Phase feeding may be divided into 5–6 periods based on milk production, gestation, feed intake, and body weight (Figure 1).

Moving cows through these phases requires good records and proper attention being given continuously. The early lactating cows and high group require the greatest attention since peak production, good health, and conception is essential. Fine-tuning the ration in each phase means more profits. In general, the fresh cows are maintained in a fresh-cow group for a period of 1–3 weeks and fed more roughage than the high group in order to avoid possible metabolic problems. Afterwards, they are moved to the high group and fed free choice for a period of 100–150 days and longer if performance of the cow is adequate to keep her in the high group.

Grouping cows by level of milk production and feeding accordingly appears to be the most effective approach in controlling feed costs while still achieving maximum milk production. A well-designed program should not allow cows to be changed more than 2–3 times in the lactation. A lot of flexibility may be used in grouping cows, and some may be similar to the following pattern:

1. Fresh cow group
2. High group
3. Medium-high group
4. Medium group
5. Low group

The question that frequently arises is how to group first-calf heifers. The first-calf heifer undergoes considerable social change at the time of calving when her daily routine and feeding patterns change, and she is placed with more mature and aggressive cows. The stress of such a change is partially reduced by allowing her to move through the milking barn prior to calving. This gets her familiar with the new surroundings. Also, there is an advantage in having first lactation cows with older fresh cows during the first few days of lactation for closer observation, ease in training, and developing good milking habits.