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G86-783 Complete Rations -- Should You Feed Them?

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Complete Rations--
Should You Feed Them?

This NebGuide discusses the advantages and disadvantages of feeding complete rations to dairy herds.

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Using the complete ration system for feeding dairy cows has become increasingly popular. Nutritionists generally consider it the ideal method of feeding dairy cattle. Milk production per cow can be maximized, and feed and labor costs minimized, with this system. However, the necessary equipment is expensive and may be excessive for loose-housed herds of less than 100 cows.

Definition

The term complete ration (CR) is used interchangeably with total mixed ration (TMR), total blended ration, and complete feeds. Such rations are prepared by mixing together, in measured proportions, the feed ingredients required to furnish all the nutrients and other dietary factors needed in a particular ration. This means that the roughage and the grain ingredients, including the protein, mineral, and vitamin supplements, and other additives are all fed as one mixture.

Reasons for Developing Complete Rations

- As herds have grown larger, dairy producers have seen a need to simplify their feeding operation and reduce their labor requirements.
- Newly developed equipment now allows most of the process to be mechanized, reducing the labor and drudgery of feeding.
- As the milk producing ability of cows has increased, dairy producers find that their cows are not able to consume the large amount of concentrate mix needed to meet their needs during the time

needed for milking. They must allow considerable extra time to feed grain in the parlor or the genetically high ability cows do not reach their potential.

- Dairy producers find that the control of intake is poor, or very difficult, with parlor-feeding of grain. In addition, it is nearly impossible to provide several different rations as needed by cows producing at various levels.

For these reasons dairy producers have continued to search for better and easier methods for feeding their cows. In some herds a portion of the grain ration is fed in an outside bunk mixed with, or on top of, silages. Other producers use magnetic activated feeders, transponder activated feeders, electronic feeder doors, or computer controlled feeders. However, none of these systems will control the proportion of forage-to-grain actually consumed by each cow.

Studies have shown that preferences for forages differ greatly among cows. For example, when cows could choose between corn silage and alfalfa haylage, intake of corn silage varied among cows from 24 to 78 percent of the total forage dry matter consumed. This presents a major problem when trying to balance rations. There is no indication that dairy cows will balance low protein forages with high protein forages, nor can they select the needed minerals when allowed free access to wide assortments. Thus, the complete ration is the preferred, and probably the only, method available to properly control composition of the total ration.

Advantages of Full-Fed Complete Rations

1. These rations can be precisely balanced so that each bite is nutritionally adequate for a particular group of cows.
2. The roughage-to-grain ratio can be varied to regulate nutrient intake. As cows decline in milk production, the roughage level can be increased to avoid excessive intake and resulting "fat-cow" problems.
3. Greater use can be made of non-protein nitrogen (NPN) sources such as urea or ammonia. This is because NPN is more efficiently utilized when consumed frequently in small amounts. Experimental data has demonstrated considerably higher milk yield from feeding rations with NPN as complete rations versus the same formulation in which the NPN-containing grain mix was fed twice daily.
4. The frequent consumption of small amounts of ration also helps maintain a more stable rumen environment, including pH, thus decreasing metabolic disorders. This is especially helpful when high starch (grain) rations are fed. When the rumen receives the common grain rations in only two large "slugs" daily, the rumen pH drops, fiber digestibility is reduced, and the cows may go off-feed and suffer other adverse effects.
5. Complete ration preparations permit use of certain ingredients and higher levels of ingredients that may otherwise have undesirable qualities related to physical form or palatability. The silages commonly used in these types of rations help mask the flavor of certain by-product feeds and, by adding moisture, also reduce dustiness and thereby decrease waste and improve intake.
6. For similar reasons, these rations allow for changes in feed ingredients that may otherwise cause disruptions of intake.
7. Feeding complete rations requires less labor as the feeding operations are readily mechanized and, in some cases, automated. One or two feedings per day of a complete ration often replaces two or three feedings of grain plus two to four feedings of hay and silage.
8. Low fat test problems are minimized since the required fiber level can be maintained in the ration.
9. Grain feeding in the milking parlor can be eliminated, resulting in calmer cows, less feed waste, and reduced dust. Milking time is reduced, minimizing manure in the parlor and shortening clean-up time.
10. Parlor grain feeding equipment is not needed, saving its investment, maintenance, and operating

costs.

11. Milking rate is more uniform because cows are grouped by production level.
12. Checking heats and reproductive management is also facilitated because those in similar stages of reproduction are mostly in the high producing group.

Disadvantages of Full-Fed Complete Rations

1. Cows should be grouped for feeding. At least three groups are needed. Since handling cows in small groups requires a relatively high labor input, herds of less than about 100 to 150 cows may find this system impractical. Small groups would result in excessive cost per cow for lot facilities, lot cleaning, and moving cows for parlor milking. Yet, if the animals are not grouped, cows in late lactation are likely to become overfed and develop "fat-cow" problems.
2. Special equipment is needed. This equipment should be able to weigh, mix the ingredients, and dispense the ration. Such equipment may be impractical for the smaller, loose-housed herds because of its cost.
3. Precise ration formulation and frequent monitoring of ration analysis are necessary.
4. Baled or long hay is a problem because hay must be chopped before it can be blended. Even then it is less desirable because its abrasive effect on mixing equipment reduces its useful life. Furthermore, fine ingredients more easily sift through dry forage, producing variable ration quality.

What to Expect from Complete Rations

Comparisons of the complete ration system with a system in which the forage and grain are fed separately have shown that the production of cows on the two systems are either similar or slightly higher for the complete ration systems. Reports generally show no difference in milk fat content for the two systems. However, higher milk fat tests are sometimes reported when feeding the grain ration several times daily compared to feeding on a twice daily basis. In terms of health, we frequently see reports of reduced digestive problems on the complete feeding system. One report indicated a 10 percent lower veterinary cost by using the complete ration system. There is also some evidence that reproductive performance is better on complete rations compared to parlor feeding.

Additional benefits reported for complete rations include a savings in grain purchases because of less waste during feeding. Savings are realized from eliminating parlor feeding equipment, and reduced time required for the milking operation and clean-up. The complete ration system does require additional cost, principally the mixer box or wagon and scales, crowd gate, grain bins, and possible additional fencing for group handling.

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