

# Livestock Diet Utilization

natural vegetation and cultivated feedstuffs should have favorable ratio to value of animal products they produce

George H. Hart

The proper livestock diet utilizes natural vegetation and cultivated feedstuffs to maintain continuous animal growth.

Without continuous weight gain, animals—especially young growing animals—lose their efficiency of production. Full recovery is difficult or often impossible to attain and, at best, is accomplished at an economic loss.

The failure to obtain continuous gain is most readily observed on far-western ranges under semi-arid conditions where cattle gain weight in the green-feed season, and lose in the dry season. Losses in weight can only be avoided by supplementing nutrients that are deficient in the dry-range feed. This natural feed, particularly when consisting of annual plants, changes—as drying proceeds with seed shattering, bleaching by the sun and leaching by summer rains—from a high-moisture, concentrate feed in the early green stages, to a very poor roughage. Thereby the natural feed becomes deficient in total energy, protein, vitamin A, and other food values.

Animal feeds—simple or mixtures—must bear a favorable ratio to the value of animal products they produce in order to be widely used for any length of time. This is best recognized in the corn-hog ratio where 13 bushels of corn produce 100 pounds of pork. Areas where this ratio does not exist are marginal for hog production.

## Mixed Feeds

Although vitamin A is usually purchased in the drugstore, it is a food, and antibiotics, though sold by the feed stores in mixed feeds, are drugs. Drugs—except vaccines—are usually supplied only to sick animals for a few days of their lives.

When a food—vitamin B<sub>12</sub>—and a drug—aureomycin—are used in very small quantities in feeds for swine, tur-

keys and chickens, the results include more rapid gains, apparently better feed utilization and shorter fattening periods. It is particularly advantageous to an all-plant ration such as corn and soybean meal. The vitamin B<sub>12</sub>-aureomycin addition might at least partially be able to replace the expensive animal protein feeds such as meat scrap, fish meal and dairy products.

One explanation for the beneficial results is the possible existence of a low-grade enteritis—inflammation of the intestine—with mild diarrhea in many swine, turkeys and chickens on an all-plant diet. This low-grade disease condition may be set up by harmful nonspecific bacteria in the gastrointestinal tract. The aureomycin may retard their growth with better feed utilization and resulting gains may be assisted by the B<sub>12</sub>.

Even the well-known and long-studied necrotic enteritis of swine, a great cause of unthriftiness, is said to be improved by the use of vitamin B<sub>12</sub> and aureomycin. Improvement is not so marked when a more complete diet including animal protein, or even good pasture or fresh greens is supplied.

The full significance of these findings has not yet been ascertained. The use of B<sub>12</sub> and aureomycin may be extended to calf feeding. In young calves—before rumen function develops—serious losses occur from gastrointestinal disturbance known as white scours. Even the survivors may die from calf pneumonia weeks or months later. The addition of the vitamin and aureomycin apparently has no place in the feeding of ruminants past the milk-drinking stage as it seriously affects the essential normal bacterial fermentation in the rumen of the older four-stomach species.

The sulfa drugs are another pertinent example for drugs in mixed feeds, particularly sulfaquinoxaline in poultry feed to control coccidiosis.

Mixing drugs with feeds has moved rapidly from the experimental stage to widespread practical application. However, some preparations have merit while others are in the experimental stage and still others give good evidence that they were worthless.

Among the products of recognized value, cost is an important consideration, even if it is reduced as production de-

velops greater volume. Optimum amounts must be ascertained and even though they are as little as 10 grams per ton there might be a tendency on the part of some manufacturers to cut the minimum to reduce cost for competitive advantage.

Feed control officials may find it difficult to ascertain whether the levels stated on the tags are present. The substances in the feedstuffs will interfere with the quantitative chemical tests for the drug after it is mixed with the feed.

Research has developed important practical applications in the nutrition field, and technical advice is needed constantly in feed mixing. Quantities vary so greatly in the formulas that even distribution is highly essential. This points to the limitations of producers mixing their own rations.

## Infections and Parasites

The importance of nutrition in case of bacterial and protozoal infections has not yet been established conclusively.

Feeding tests with guinea pigs have not shown that resistance to tuberculosis is associated with vigor. Optimum amounts or excess of vitamin A do not make for fewer or less severe cases of respiratory infections other than tuberculosis. At the same time lack of vitamin A will cause conditions in poultry very similar to infectious coryza in chickens and swell head in turkeys.

In the case of parasitic invasions, the importance of nutrition has been more tangibly established.

In cecal coccidiosis of growing chickens the feeding of a ration containing 40% dry skim milk was demonstrated to be beneficial. Credit for this has been ascribed to milk sugar, nutritional value of milk and laxative effect.

If sheep are maintained on a plane of nutrition that will result in the principle of continuous growth with normal growth curve, ordinary gastrointestinal parasites will not be able to make sufficient headway to require medication.

*George H. Hart is Dean of the School of Veterinary Medicine, University of California College of Agriculture, Davis.*

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