

Net Energy

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 posited in the body as meat and fat; and how much is finally available for milk production.

He found that two feeds equal in TDN might differ in the proportion of nutritive value going to productive use. A farmer would obviously prefer a feed with more milk-making power to one resulting in more urine or gases.

Flatt calls this milk-making power the net energy (NE) of a feed. For beef cattle, NE can also express a feed's potential for meat production.

A dairy farmer, for example, might want to calculate the energy produced by a feed when replacing part of the concentrates in a ration with forage.

Since NE is more accurate than TDN the farmer, by using NE for his energy calculating, would be more sure of maintaining high milk production.

Determining the NE of a feed under Flatt's system of sealing a cow inside a chamber requires much time and labor even with computerized equipment. Van Soest developed his new method to simplify this process.

One of the traditional systems which Van Soest's method may replace, the 100-year-old Weende system, attempts to imitate an animal's digestive processes by chemistry. It yields two fractions called "nitrogen-free extract" (NFE) and "crude fiber" (CF).

NFE is relatively digestible,

and CF is relatively indigestible. The Weende system is inaccurate, however, because NFE contains some feed components such as lignin which cattle cannot digest; and CF includes some fibers such as cellulose which cattle digest easily.

Instead of trying to duplicate natural digestion, Van Soest based his system on the structures of the plants he analyzes. He found that the cell contents of a plant are almost completely digested by all livestock, and that ruminants also digest cell walls to some extent.

Van Soest determines, separately, the feed value of cell contents and of cell walls, which he calls "neutral detergent fiber" (NDF). To find the value of NDF, he determines the total value of the cell wall fibers cellulose and lignin, which he calls "acid detergent fiber" (ADF).

Then, he determines the pro-

portion of lignin in ADF. This, he finds provides a close estimate of the digestibility of cell walls.

A comparison of bromegrass and alfalfa hay illustrates the value of Van Soest's system. Samples of grass and legume hay might be found equal in digestibility by the Weende system, because their crude fiber is equal.

However, Van Soest's system would show that even the grass sample had more fiber than the alfalfa. It might still be more digestible to ruminant because the proportion of digestible fiber (the ratio of lignin to ADF)

greater in the grass.

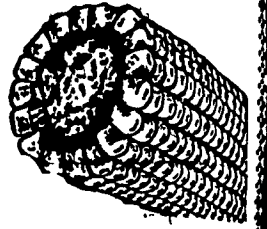
Van Soest's system requires no more laboratory work than the Weende system. Thus, the new method is practical, not only for research, but also for feed quality control work and rapid testing of samples submitted by farmers who wish to pinpoint the feeding value of their forages.

And the detergent system works easily on mixtures of different feeds such as those in pellets. A meaningful digestibility estimate on mixed from a Weende analysis is much more difficult to obtain.

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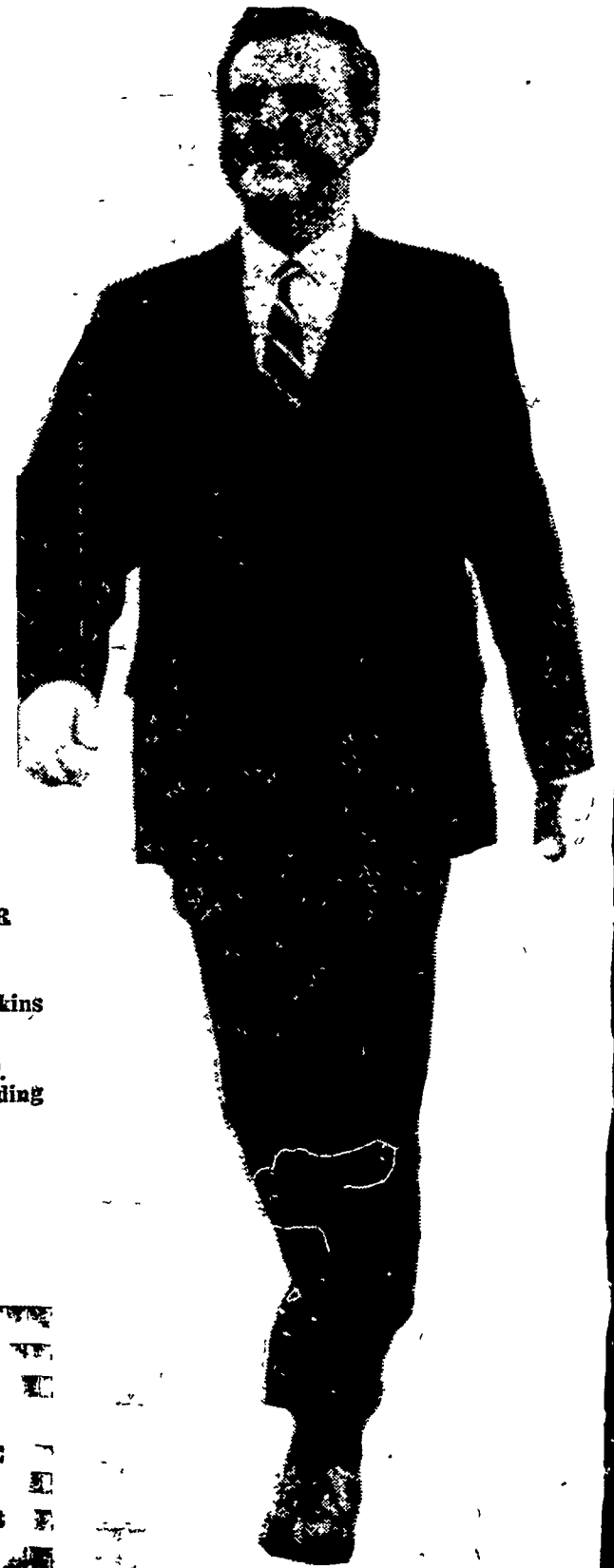
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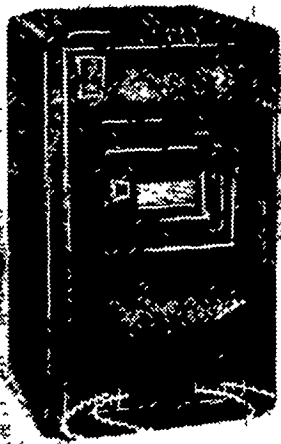
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