FATS AND PROTEINS RESEARCH FOUNDATION, INC.

Director's Digest

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INTRODUCTION:

We have recently concluded two projects that studies the utilization of animal proteins in newly received feeder cattle diets. The principal investigator was Dr. R. L. Preston of Texas Tech University. Below is a summary of that work which was prepared by Drs. Preston and Bartle.

F.D.B.

OPTIMAL PROTEIN LEVEL AND RUMEN BYPASS PROTEIN SOURCES FOR NEW FEEDER CATTLE

By

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Protein and other nutrients are of critical importance in newly received feeder cattle at the feedlot. This is because protein requirements are relatively high and feed intake is relatively low due to the stress involved during shipment. Theoretical calculations and actual experimental results indicate that part of this protein should bypass rumen microbial degradation and be digested and absorbed directly by the animal to better provide protein and amino acids at this time. Animal byproduct feeds are high in protein and also high in rumen bypass protein. These byproduct feeds include meat and bone meal, hydrolyzed feather meal and blood meal. Corn gluten meal is also high in rumen bypass protein. The work presented here was designed to determine the optimal combination of rumen bypass protein sources for new feeder cattle.

Our initial research showed that an equal protein mixture of blood meal and corn gluten meal supported a higher rate of gain and gain efficiency than either cottonseed meal or urea. It was concluded that 60% of the dietary crude protein for new feeder cattle should be bypass protein. Further research indicated that at least 45% of the protein should be bypass protein. A major conclusion from this work was a proposed "ideal mixture" of protein sources to optimize the amount of rumen bypass protein and also bypass amino acids, especially isoleucine, for new feeder cattle.

In the most recent experiment, 300 head of Hereford steers that had been grazing wheat pasture were randomly assigned to 10 different protein levels or sources of bypass protein for the first 28 days after they were received at the Burnett Center. Actual levels of protein fed were 8, 11, 12, or 14% crude protein (dry matter basis) with the supplemental protein being supplied by either blood meal, hydrolyzed feather meal, meat and bone meal or the "ideal" mixture of rumen bypass protein. The remainder of the diet consisted of steam-flaked sorghum grain, corn silage, cottonseed hulls, fat, molasses and a mineral-vitamin supplement. Aureo-S 700 was fed for the first 21 days. The steers received typical processing treatments upon arrival.

The results showed that gain and gain efficiency were maximized in these steers when the receiving diet contained 12.8% crude protein (dry matter basis). This is shown in Figure 1. This conclusion is very similar to an earlier conclusion summarizing three different experiments involving 1,360 cattle (Figure 2).

Comparing the sources of supplemental rumen bypass protein, it can be seen (Figure 1) that hydrolyzed feather meal (HFM), as the only source of supplemental protein, resulted in lower gain efficiency whereas the "ideal" source of supplemental protein (I) resulted in gain efficiency that was above the average response for this experiment. Blood meal (BM) and meat and bone meal (MBM) were intermediate in their effect on gain efficiency.

From these results, it appears that the "ideal" combination of supplemental rumen bypass protein was superior to any of the bypass protein sources fed alone in steam-flaked sorghum grain/corn silage diets. The composition of this "ideal" combination was a follows: blood meal, 15%; corn gluten meal, 8%; cottonseed meal, 11%; hydrolyzed feather meal, 33%; meat and bone meal, 22%.

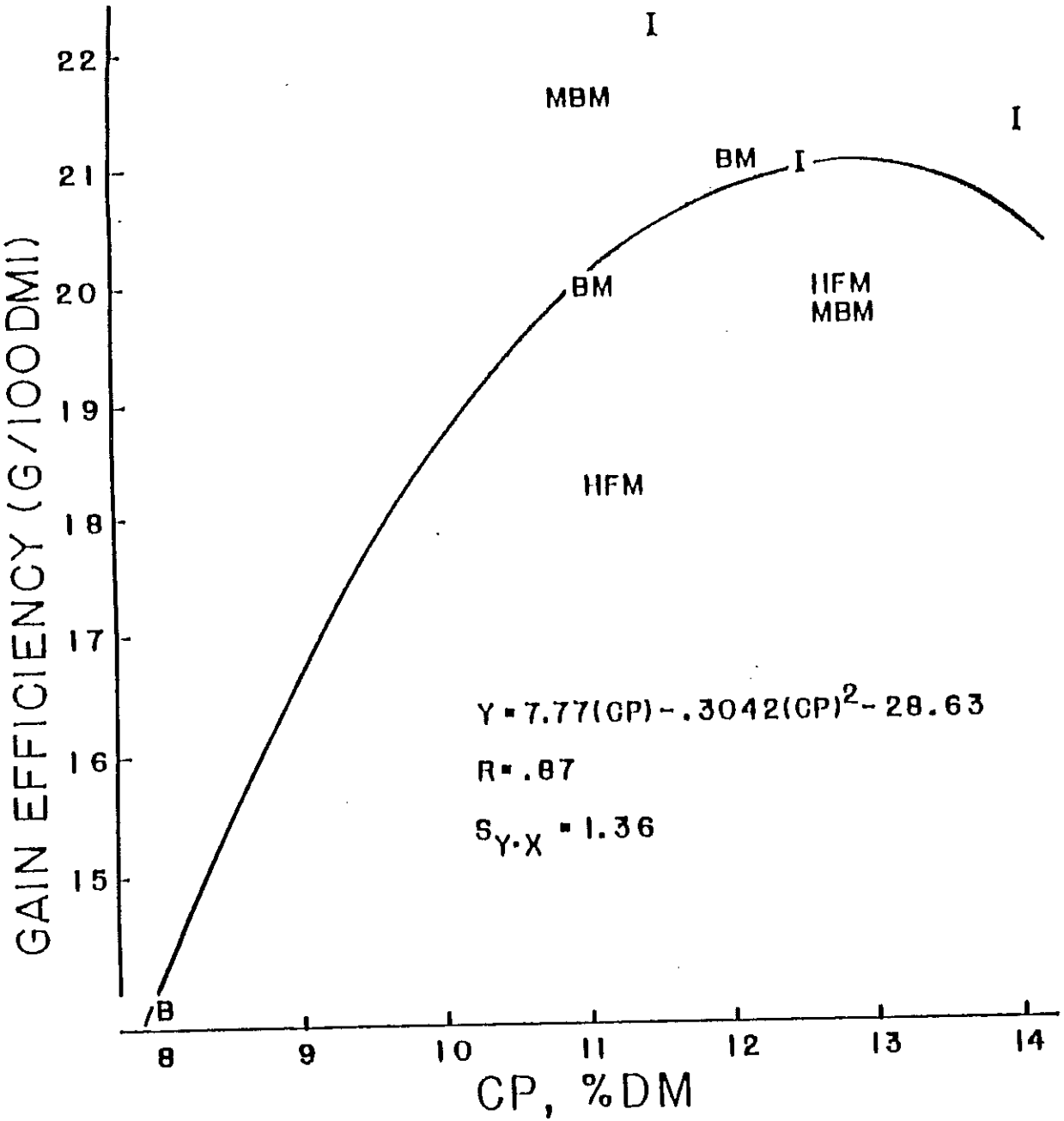

Figure 1. Effect of dietary crude protein level and source on gain efficiency of new feeder cattle

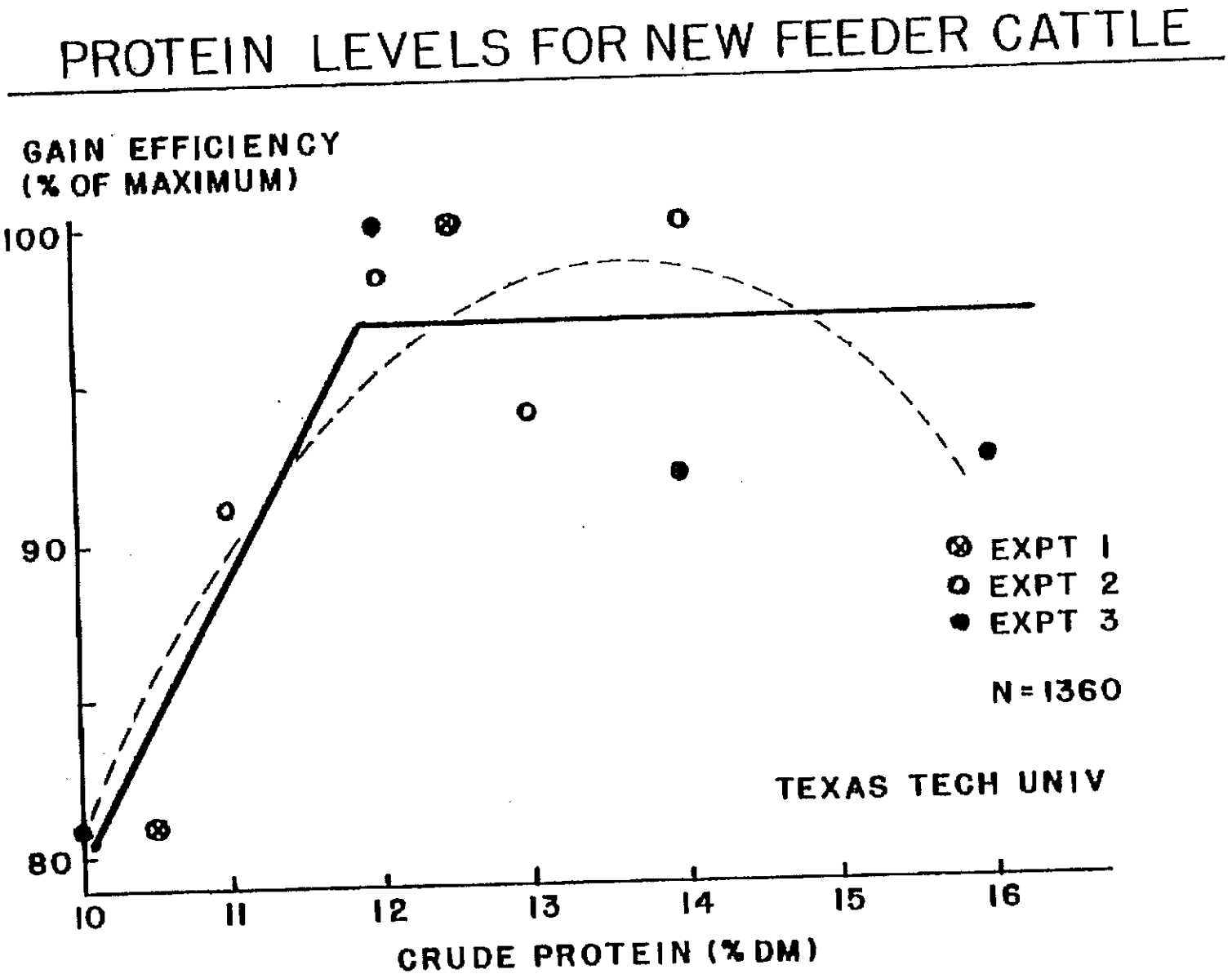

Figure 2. Protein level for new feeder cattle