

BURNETT CENTER INTERNET PROGRESS REPORT

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Summary of the 2000 Texas Tech University Consulting Nutritionist Survey

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Introduction

Nutritional recommendations and practices of consulting nutritionists can provide an important indication of how nutrient requirement recommendations are applied in practice. For example, Galyean (1996) surveyed six consulting nutritionists with regard to CP levels and sources in feedlot finishing diets. Results indicated that consultants were recommending CP levels in excess of those calculated with the NRC (1984) factorial approach but in close agreement with those suggested by the NRC (1996) metabolizable protein system.

The present survey was conducted during Summer, 2000 in an effort to provide a comprehensive evaluation of current nutritional recommendations by feedlot consulting nutritionists. The results should provide important information for future NRC beef cattle subcommittees, in addition to providing reference points for use by academic, industry, and technical service professionals.

Procedures and Survey Questions

Procedures. Twenty-five consulting nutritionists were contacted to determine their willingness to participate in the survey. These nutritionists were selected to represent practices in all the major cattle feeding areas of the United States (e.g., Midwest, High Plains, Southwest). All 25 consultants contacted agreed to participate;

however, some expressed reservations, indicating that they would decide whether to participate after they reviewed the survey. The survey was mailed to each participant, with a guarantee of anonymity of responses and a request that completed surveys be returned at the earliest possible convenience. Of the original 25 surveys mailed, two consultants declined to participate after review of the survey, and four failed to return their surveys, yielding 19 complete responses to the survey.

Results were tabulated in an Excel[®] spreadsheet for each participant. The number of responses per question, and the mean, minimum value, maximum value, and mode (most frequently occurring value) were calculated for questions with a numeric response.

Survey Questions. The full list of questions in the survey mailed to each of the 25 consulting nutritionists is shown in the following section.

General Information

1. What is the nature of your consulting practice (check one)?
 - a. Independent
 - b. Corporate
 - c. Other (Please describe briefly)

2. Approximate number of cattle per year that your practice serves?
3. States in which your clients are located?

General Commodity Information for Finishing Diets

Grains and Grain Processing – Please classify mixtures of grains or grain processing methods as a specific type of grain or grain processing method – e.g., primary grain = corn + wheat mixture, or primary grain processing = steam flaking + high moisture harvesting.

1. Primary grain used by your clients in finishing diets?
 Second most common grain used?
2. Primary grain processing method used in finishing diets?
 Second most common processing method used?
3. Level of inclusion of grain in the finishing diet (% of DM)?
4. Bulk density and(or) starch availability recommended when steam-flaked grains are used?
 - a. Corn
 - b. Milo

Grain Byproduct Use

1. Percentage of your clients who use grain byproducts in finishing diets?
 Primary grain byproduct used in finishing diets?
2. Level of inclusion of grain byproduct in finishing diets (% of DM)?

Roughage Sources and Level

1. Primary roughage source used by your clients in finishing diets?
 Second most common roughage source used?
2. Level of inclusion of roughage in finishing diets (% of DM)?

Supplements and Micro Ingredients

1. Percentage of your clients who use the following in finishing diets?
 Liquid supplements
 Pelleted dry supplements
 Loose (meal) dry supplements
2. Percentage of your clients who use micro-ingredient machines?

Liquid Feeds

1. Percentage of your clients who use added non-fat liquids in finishing diets?
 - a. Primary non-fat liquid used in finishing diets?
 - b. Recommended level of non-fat liquid in finishing diets (% of DM)?
2. Percentage of your clients who use added fat in finishing diets?
 - a. Primary fat source used in finishing diets?
 - b. Recommended level of fat in finishing diets (% of DM)?

Formulation Information for Finishing Diets

Information Resources for Nutritional Recommendations

1. What is the primary source of information on nutrient requirements of beef cattle that you use in formulating nutritional recommendations?
 - a. NRC (1976)
 - b. NRC (1984)
 - c. NRC (1996)
 - d. Other (Please specify)
2. If you use the NRC (1996) publication for beef cattle, do you use Level 1, Level 2, or both?

Protein Level and Sources

3. Protein level recommended for finishing diets (% of DM)?
4. Urea level recommended for finishing diets (% of DM)?
5. Primary natural protein source used by your clients?
Second most used natural protein source?
6. Do you formulate for degraded intake protein (DIP) and undegraded intake protein (UIP)?

Major Mineral Levels

1. Calcium level recommended in finishing diets (% of DM)?
Primary source of supplemental calcium?
2. Phosphorus level recommended in finishing diets (% of DM)?
 - a. Is supplemental P added to finishing diets?

b. Primary source of supplemental P if used?

3. Magnesium level recommended in finishing diets (% of DM)?
4. Potassium level recommended in finishing diets (% of DM)?
5. Sulfur level recommended in finishing diets (% of DM)?
6. Salt level recommended in finishing diets (% of DM)?
7. Extent to which concentrations of major minerals in basal dietary ingredients are considered in formulation (check appropriate answer)?
 - a. Basal mineral concentrations are given full value in formulation.
 - b. Basal minerals concentrations are given partial value in formulation.
Please provide the partial value assumed for each major mineral.

Trace Mineral Levels and Sources

1. Level of copper recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of copper used?
 - b. Assumed value of copper in basal ingredients (% of total)?
2. Level of zinc recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of zinc used?

- b. Assumed value of zinc in basal ingredients (% of total)?
3. Level of manganese recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of manganese used?
 - b. Assumed value of manganese in basal ingredients (% of total)?
4. Level of iron recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of iron used?
 - b. Assumed value of iron in basal ingredients (% of total)?
5. Level of selenium recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of selenium used?
 - b. Assumed value of selenium in basal ingredients (% of total)?
6. Level of iodine recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of iodine used?
 - b. Assumed value of iodine in basal ingredients (% of total)?
7. Level of cobalt recommended in finishing diets (mg/kg of DM)?
 - a. Primary source of cobalt used?
 - b. Assumed value of cobalt in basal ingredients (% of total)?

Vitamin Supplementation Practices

1. Vitamin A level recommended in finishing diets (specify IU/lb or IU/kg)?
2. Vitamin E level recommended in finishing diets (specify IU/lb or IU/kg)?

Special Considerations for Stressed (Newly Received) Cattle

1. Recommended level of CP in the receiving diet (% of DM)?
2. Recommended level of roughage in the receiving diet (% of DM)?
3. Preferred grain for the receiving diet?
4. Preferred grain processing method for the receiving diet?
5. Is hay offered to cattle on arrival? If yes, for how long is hay fed?
6. Are grain byproducts used in the receiving diet, and if so, which byproducts?
7. Recommended levels of major minerals for stressed cattle in complete diet:
 - a. Calcium (% of DM)?
 - b. Phosphorus (% of DM)?
 - c. Magnesium (% of DM)?
 - d. Potassium (% of DM)?
 - e. Salt (% of DM)?
8. Recommended levels of trace minerals for stressed cattle in the complete diet:
 - a. Copper (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

b. Zinc (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

c. Manganese (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

d. Iron (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

e. Selenium (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

f. Iodine (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

g. Cobalt (mg/kg of DM)?

Recommended ratio of inorganic:organic sources?

9. Recommended vitamin A level in receiving diets (specify IU/lb or IU/kg)?

10. Recommended vitamin E level in receiving diets (specify IU/lb or IU/kg)?

Additional Questions

1. Have you altered or plan to alter recommendations on nutrient concentrations in finishing diets as a result of environmental regulations

or anticipated regulations? If so, which nutrient recommendations have been altered or will be altered?

2. Are there any other nutrients besides those listed above, particularly minerals or vitamins, which you supplement in finishing diets?

3. Are there any other nutrients besides those listed above that you think might be promising supplements in finishing diets but for which additional research is needed before you would recommend their use?

Results and Discussion

Summarized responses to most of the survey questions are shown in Table 1. Some questions yielded sufficiently varied responses (e.g., protein and mineral sources used in finishing diets) that we chose not to include a summary of them in Table 1.

Corn was clearly the principal grain used by the feedlots serviced by these nutritionists, with steam flaking being the most important processing method. Alfalfa was the most common roughage source, followed by corn silage. Use of other roughage sources seemed to be very limited. For the most part, the average values for nutrient recommendations tended to agree with recommendations of NRC (1984, 1996). Average CP level in the finishing diet was very similar to that reported by Galyean (1996), and most major and trace mineral recommendations fell within a range of from one to two times the NRC (1984, 1996) recommendations. The average vitamin A level was approximately twice the NRC (1984, 1996) recommendation, whereas vitamin E fortification practices seemed slightly lower than NRC (1984, 1996) recommendations. Nutrient

recommendations for diets of newly received cattle generally followed NRC (1996) guidelines.

Summary and Conclusions

Nineteen consulting nutritionists representing all the major cattle feeding areas of the United States responded to the Texas Tech University Consulting Nutritionist Survey – 2000. Summary data from this survey should provide valuable information for subsequent revisions of the NRC publication on beef cattle nutrient requirements. In addition, these results provide a useful benchmark of industry nutrition practices for evaluation and use by academic and industry professionals.

Literature Cited

- Galyean, M. L. 1996. Protein levels in beef cattle finishing diets: Industry application, university research, and systems results. *J. Anim. Sci.* 74:2860.
- NRC. 1984. *Nutrient Requirements of Beef Cattle* (6th ed.). National Academy Press, Washington, DC.
- NRC. 1996. *Nutrient Requirements of Beef Cattle* (7th ed.). National Academy Press, Washington, DC.

Table 1. Consulting Nutritionist Survey - 2000 - Overall Summary^a

Question	Mean	Count	Min	Max	Mode
Cattle serviced per year by practice	735,278	18	20,000	2,500,000	600,000
Primary grain used	17 = corn; 2 = corn & milo	19	-	-	-
Secondary grain used	6 = milo; 5 = wheat; 2 = barley; 3 = milo & wheat; 3 = not applicable	19	-	-	-
Primary grain processing method	15 = steam flaked; 3 = dry rolled	18	-	-	-
Grain in finishing diet	78.00%	18	66.00%	87.00%	80.00%
Corn bulk density, lb/bu	26.97	16	22	29	26
Corn starch availability	57.40	10	50	65	57.5
Milo bulk density, lb/bu	25.89	14	22	29	27
Milo starch availability	63.25	6	57.5	70	-
Primary roughage source used	13 = alfalfa; 4 = corn silage; 1 = cottonseed hulls; 1 = sudan hay	19	-	-	-
Secondary roughage source used	10=corn silage; 4 = alfalfa; 2 = cottonseed hulls; 3 = other	19	-	-	-
Roughage level in finishing diet	8.89%	19	4.50%	13.50%	9.00%
Client use of liquid supplement	58.37%	19	0.00%	100.00%	80.00%
Client use of pelleted supplement	40.71%	17	0.00%	100.00%	20.00%
Client use of loose meal supplement	13.00%	18	0.00%	100.00%	0.00%
Client use of micro-machines	41.63%	19	0.00%	100.00%	0.00%
Client use of non-fat liquid	71.79%	19	10.00%	100.00%	100.00%
Non-fat liquid level in finishing diet	4.13%	18	1.75%	7.50%	4.00%
Client use of fat	76.00%	19	0.00%	100.00%	100.00%
Fat level in finishing diet	3.68%	19	2.50%	6.50%	2.50%
Information source	8 = 1984; 6 = 1996; 4 = both 1984 & 1996; 1 = both 1976 & 1996	19	-	-	-
Protein level in finishing diets	13.31%	19	12.50%	14.00%	13.50%
Urea level (x 2.87 for NPN)	1.05%	13	0.78%	1.35%	1.1%
Formulate with DIP and UIP	14 = No; 5 = Yes	19	-	-	-
Calcium level in finishing diet	0.70%	18	0.60%	0.90%	0.70%
Phosphorus level in finishing diet	0.31%	18	0.25%	0.35%	0.30%
Magnesium level in finishing diet	0.21%	18	0.15%	0.30%	0.20%
Potassium level in finishing diet	0.74%	19	0.60%	1.00%	0.70%
Sulfur level in finishing diet	0.19%	13	0.10%	0.34%	0.20%

Table 1 (Cont.). Consulting Nutritionist Survey - 2000 - Overall Summary^a

Question	Mean	Count	Min	Max	Mode
Salt level in finishing diet	0.35%	17	0.25%	0.50%	0.25%
Copper level in finishing diet, mg/kg	14.75	19	6	20	20
Value of basal ingredient copper	65.20%	16	0.00%	100.00%	100.00%
Zinc level in finishing diet, mg/kg	74.03	19	15	150	50
Value of basal ingredient zinc	59.94%	17	0.00%	100.00%	100.00%
Manganese level in finishing diet, mg/kg	38.28	19	12	80	40
Value of basal ingredient manganese	63.13%	17	0.00%	100.00%	100.00%
Iron level in finishing diet, mg/kg	55.90	16	0	150	50
Value of basal ingredient iron	84.55%	12	0.00%	100.00%	100.00%
Selenium level in finishing diet, mg/kg	0.21	19	0.06	0.3	0.3
Value of basal ingredient selenium	46.33%	16	0.00%	100.00%	0.00%
Iodine level in finishing diet, mg/kg	0.75	16	0.1	1.5	0.5
Value of basal ingredient iodine	29.67%	16	0.00%	100.00%	0.00%
Cobalt level in finishing diet, mg/kg	0.24	18	0.06	0.59	0.1
Value of basal ingredient cobalt	41.25%	17	0.00%	100.00%	0.00%
Vitamin A level in finishing diet, IU/lb	2,070.2	13	1,500	3,300	2,000
Vitamin E level in finishing diet, IU/lb	3.64	12	0	10	0
Protein level in receiving diets	14.44%	17	13.75%	16.00%	14.00%
Roughage level in receiving diets	33.67%	18	13.50%	48.00%	40.00%
Calcium level in receiving diet	0.78%	19	0.55%	1.00%	0.75%
Phosphorus level in receiving diet	0.35%	19	0.25%	0.40%	0.35%
Magnesium level in receiving diet	0.25%	18	0.18%	0.50%	0.25%
Potassium level in receiving diet	1.15%	19	0.70%	1.70%	1.10%
Salt level in receiving diet	0.42%	19	0.25%	0.60%	0.50%
Copper level in receiving diet, mg/kg	20.42	18	11	40	20
Organic copper use	17.50%	12	0.00%	50.00%	0.00%
Zinc level in receiving diet, mg/kg	94.06	18	33	150	150
Organic zinc use	23.85%	13	0.00%	75.00%	0.00%
Manganese level in receiving diet, mg/kg	49.33	18	22	120	50
Organic manganese use	7.73%	11	0.00%	30.00%	0.00%

Table 1 (Cont.). Consulting Nutritionist Survey - 2000 - Overall Summary^a

Question	Mean	Count	Min	Max	Mode
Iron level in receiving diet, mg/kg	66.3	16	0	150	50
Organic iron use	0.00%	8	0.00%	0.00%	0.00%
Selenium level in receiving diet, mg/kg	0.25	17	0.1	0.3	0.3
Organic selenium use	0.00%	9	0.00%	0.00%	0.00%
Iodine level in receiving diet, mg/kg	0.92	17	0.1	2	1
Organic iodine use	47.5%	8	0.00%	100.00%	0.00%
Cobalt level in receiving diet, mg/kg	0.33	18	0.07	1	0.5
Organic cobalt use	3.89%	9	0.00%	30.00%	0.00%
Vitamin A level in receiving diet, IU/lb	3,660.4	12	1,600	7,000	3,000
Vitamin E level in receiving diet, IU/lb	19.2	13	0	60	15

^a19 respondents total; Count indicates respondents per question.