

# **PUBLICATIONS**

**1996**

# **FIELD DAY REPORT - 1996**

## **TEXAS A&M UNIVERSITY AGRICULTURAL RESEARCH and EXTENSION CENTER at OVERTON**

**Texas Agricultural Experiment Station  
Texas Agricultural Extension Service**

**Overton, Texas**

**April 18, 1996**

**Research Center Technical Report 96-1**

---

All programs and information of the Texas Agricultural Experiment Station and Texas Agricultural Extension Service are available to everyone without regard to race, color, religion, sex, age, or national origin.

Mention of trademark or a proprietary product does not constitute a guarantee or a warranty of the product by the Texas Agricultural experiment Station or Texas Agricultural Extension Service and does not imply its approval to the exclusion of other products that also may be suitable.

## UTILIZING BROILER LITTER AS A PROTEIN AND MINERAL SUPPLEMENT FOR BEEF COWS

D. S. Doctorian and G. W. Evers

**Background.** Mineral supplementation, especially calcium and phosphorus, is recommended for beef cattle in East Texas throughout the year. During the winter feeding period, beef cattle are also supplemented with protein if fed a low quality hay. The expanding broiler industry in East Texas generates large quantities of poultry litter (poultry excreta, feathers, wasted feed and bedding material) which is high in protein and minerals. Most poultry growers and some beef cattle producers in East Texas feed broiler litter to beef cows during the winter because of its low cost in comparison to regular protein and mineral supplements.

**Current Information.** "Feed quality" broiler litter should be more than 19% protein (2.9% N), less than 28% ash and 25% moisture, and free of rocks and hardware such as nails and wire. Litter containing more than 28% ash indicates soil contamination when it was removed from dirt floor poultry houses. The moisture and nutrient content of broiler litter is quite variable as shown in Table 1.

Table 1. Average and range of nutrients in 61 poultry litter samples being fed to livestock in northeast Texas during the 1993-94 winter (G. W. Evers, W. Greene, and J. B. Carey).

Nutrient	Average	Range
	-----%-----	
Moisture	22.3	14.0 - 38.9
Protein	21.5	13.2 - 31.4
Nitrogen (N)	3.44	2.11 - 5.02
Phosphorus (P)	1.79	1.06 - 2.74
Potassium (K)	2.59	1.42 - 3.70
Calcium (Ca)	2.15	1.18 - 3.99
Magnesium (Mg)	0.55	0.29 - 0.90
Sodium (Na)	0.97	0.53 - 2.18

Upon removal from the poultry house or delivery, broiler litter should be stacked 5 to 6 feet deep under a roof to protect it from the rain. The stack goes through a heat process to over 130°F which kills any pathogenic bacteria and residual medication from the poultry. The litter stack should also be covered with plastic to prevent the temperature from rising above 140°F if the moisture content is greater than 25%. If the temperature exceeds 140°F, nitrogen becomes bonded

or insoluble, and protein digestibility decreases. Although broiler litter is high in protein and minerals, it is low in energy. A high energy source such as grain, molasses, recycled bakery products, etc. may be mixed with broiler litter to provide a more balanced ration and improve palatability of the litter. Recommended corn:litter rations are 1:9, 3:7, and 1:1 for dry cows, cows nursing calves, and stocker calves, respectively. Producers report that up to about 3% of the cows may not learn to eat broiler litter.

Herd health problems associated with feeding litter are hardware disease, milk fever or "downer cows", dystocia (calving difficulty), breeding, copper toxicity, and bloat. Hardware disease (consumption of nails and other metals in the litter) can be reduced by the use of magnetic plates on feed mixers. Milk fever is associated with a calcium or magnesium deficiency immediately after calving. Research from Auburn University has shown that feeding at least 2 to 3 lb of hay/head/day reduces the risk of milk fever.

Consuming large amounts of broiler litter or corn-litter mix can result in calving problems because of the high protein content. This is especially true for first-calf heifers. Reports of delayed puberty and irregular estrous cycles in heifers are rare but have been reported. One thought is that the abundant amounts of non-protein nitrogen in broiler litter could impair reproductive function as a result of elevated concentrations of ammonia in both heifers and cows. If broiler litter constitutes less than 35% of the diet, breeding problems seldom occur.

Broiler litter contains high levels of copper. During the winter feeding season copper builds up in the liver tissue but will dissipate when the animal returns to pasture. Sheep and goats do not have the ability to eliminate copper from the liver and will die if fed broiler litter for periods longer than 90 to 120 days. Bloat has only been a problem with weanling steers and heifers on diets containing equal amounts of broiler litter and grain or some other energy source. A bloat preventative should be added to the diet. Feeding 3.5 lb hay/head/day to weanling steers on a corn-litter diet increased their average daily from 0.85 to 1.69 lb.

**Recommendations.** Poultry litter is an effective way to cut production costs and help meet a cow's protein and mineral needs. Obtain feed quality broiler litter from a reliable poultry grower or clean-out contractor and have it analyzed for nutrient content. Many herd health problems can be avoided by feeding free choice hay and limiting litter intake from 5 to 10 lb/head/day. Weanling stocker calves should receive at least 3.5 lb hay/head/day to improve weight gain.

**Acknowledgement.** The poultry litter survey and analysis were supported by the Tennessee Valley Authority, Texas Poultry Federation, and Texas Broiler Council.