



Co-Product Utilization in the Sheep Operation

Christopher S. Schauer

***Director and Animal Scientist
NDSU - Hettinger Research
Extension Center***



Prepared for Sheep Management WisLine Program

Phosphorus Concerns:

- Requirement: 0.2 % of diet
 - 2:1 to 7:1 calcium to phosphorus ratio
 - **Most grains (especially co-products) are excessive**
 - Dicalcium phosphate
- **Toxicity:** Urinary calculi in rams and wethers!
 - Treat with 7-10 grams/head/day of ammonium chloride (10#/ton)

Calcium Concerns:

- **Requirement: 0.4 – 0.5 % of diet**
 - Most forages are adequate
 - Ground limestone, dicalcium phosphate
- **Deficiency: Abnormal bone development (rickets), tetany (muscle spasms), urinary calculi.**
- **Toxicity: Not likely, but may cause deficiency in other minerals.**

Sulfur Concerns:

- Requirement: 0.14 – 0.26% of diet
 - Most feedstuffs are adequate
 - **Co-products can be extremely high!**
 - Sodium methionine and sulfate
- Deficiency: Loss of appetite, reduced gains, reduced wool growth, wool shedding
- Toxicity: **0.4% of diet**
 - Decreased intake
 - Ties up Copper and Molybdenum

Copper Concerns:

- **Requirement: 7 – 11 ppm**
 - Most feedstuffs are adequate, but Sulfur and Molybdenum tie up copper when they are excess (by-product diets)
 - Copper sulfate (0.5% of ration) will increase copper in the diet

Grain Co-Products

	CP (%)	TDN (%)	Comments
Corn	10	90	
Barley malting pellets	14	74	Palatable; Use in creep or backgrounding rations
Corn gluten feed	22	83	High in phosphorus and sulfur (1/3 of diet or less)
Distillers grains	33	87	High in phosphorus and sulfur (20% of diet or less) Handling problems
Wheat screenings	16	72	Up to 40% of finishing ration
Sunflower screenings	5	40	Low quality, primarily a roughage source
Wheat midds	19	83	Less than 40% of the concentrate during finishing

Oilseeds and Oilseed Co-Products

	CP (%)	TDN (%)	Comments
Canola meal	41	76	Excellent protein supplement
Crambe meal	30	70	Protein supplement, high in oil
Flaxseed	23	110	Must be ground, high in oil, less than 10% of diet
Soybeans	42	91	Use as a protein supplement, not as a grain
Soybean hulls	12	80	Excellent energy source (fiber)
Sunflower meal	39	64	Protein supplement
Safflower	18	91	High in oil

Liquid Co-Products

	CP (%)	TDN (%)	Comments
Condensed distillers solubles	28	88	95% moisture High investment Supplement, not ration
Corn steep liquor	35	88	46% moisture
De-sugared molasses (CSB)	20	67	Increases intake at 5-15% of diet
Molasses	10	75	Palatability, decrease dust, carrier Not greater than 8% of diet

Creep Feeding

- Replacement of Soybean Meal:
 - Linseed or cottonseed meal (1:1)
 - Distillers' dried grains
 - Corn Gluten Pellets
- } Palatability is a concern

Ewe Rations

- **Roughage replacement options:**
 - **Sunflower screenings – may be equivalent to high quality hays**
 - **Wheat middlings – less than 40% of the diet**

Ewe Rations

- **Protein and/or energy replacement:**
 - **Corn gluten pellets – 33% of the diet or less**
 - 22% CP
 - 83% TDN
 - 1.1 # for every 1 # of corn
 - **Dried distillers grains – 20% of the diet or less**
 - 33% CP
 - 87% TDN
 - 1.05 # for every 1 # of corn
 - **Flaxseed – 10% of the diet or less**
 - 23% CP
 - 110% TDN
 - Must be ground, high in oil

Ewe Rations

- **Protein and/or energy replacement:**
 - **Sunflower meal – protein supplement**
 - 39% CP
 - 64% TDN
 - **Safflower – high in oil**
 - 18% CP
 - 91% TDN
 - **Condensed distillers solubles – 95% moisture**
 - 28% CP
 - 88% TDN
 - **Corn steep liquor – 46% moisture**
 - 35% CP
 - 88% TDN

Finishing Rations

- **Protein and/or energy replacement:**
 - **Corn gluten pellets – less than 33% of the diet**
 - **Dried distillers grains – less than 33% of the diet**
- **Ration Conditioners**
 - **Condensed distillers solubles**
 - **Corn steep liquor**

Feed Additives

Additive	Reason
Chlorotetracycline	Gain, feed efficiency, enterotoxemia
Oxytetracycline	Gain, feed efficiency, scours prevention and treatment, enterotoxemia
Lasalocid (Bovatec)	Coccidiosis
Decoquinate (Deccox)	Coccidiosis
Ammonium Chl.	Urinary calculi (10 #/ton)
Thiabendazole	Roundworms



Pricing of DDG:

- Protein source:
 - Price relative to SBM or alfalfa on a protein basis
 - \$274/ton SBM = \$88/ton alfalfa = \$181/ton DDG
 - \$40/ton alfalfa = \$83/ton DDG
- Energy source:
 - Price relative to barley or corn on a TDN basis
 - \$3.50/bu. corn = \$120.06/ton DDG

Current price of DDG = \$160/ton

Current price of corn = \$4.00/bu.



Pricing of Corn Gluten Pellets:

- Protein source:
 - Price relative to SBM or alfalfa on a protein basis
 - \$274/ton SBM = \$88/ton alfalfa = \$120/ton corn gluten
 - \$40/ton alfalfa = \$55/ton corn gluten
- Energy source:
 - Price relative to barley or corn on a TDN basis
 - \$3.50/bu. corn = \$115.20/ton corn gluten

Current price of corn gluten = \$135/ton

Co-products: Summary

- They can be excellent protein supplements or in creep feed.
- Balance for Ca:P and Sulfur content.
- In some cases, they are a good energy source.
- **Major benefit is when they are cheaper than conventional feeds!**

Additional Information

- **Sheep Production Handbook**
 - American Sheep Industry Association
- **Hettinger Research Extension Center**
 - www.ag.ndsu.nodak.edu/hettinger/
- **Alternative Feeds for Ruminants**
 - NDSU Extension Service Bulletin AS-1182
- **University of Minnesota**
 - www.extension.umn.edu



Questions?

