Chapter 15

Use of Reduced-Oil DDGS in Beef Diets

Introduction

Only one study has been conducted to determine the effects of feeding reduced-oil DDGS (RO-DDGS) on growth performance and carcass characteristics of beef feedlot cattle. No studies have been conducted to determine the effect of DDGS oil extraction on net energy content.

Research results

Researchers at the University of Nebraska (Gigax et al., 2011) evaluated growth performance and carcass characteristics of 96 finishing steers fed diets containing 1) 42.5% dry rolled corn (DRC) and 42.5% high moisture corn (HMC), 2) 25% DRC and 25% HMC with 35% wet distillers grain plus solubles containing 6.7% crude fat (RO-DDGS), and 3) 25% DRC and 25% HMC with 35% wet distillers grain plus solubles containing 12.9% crude fat (normal fat DDGS [NF-DDGS]). Growth performance and carcass data are summarized in **Table 1**. Feedlot steers fed the NF-DDGS had increased final body weight, ADG, and hot carcass weight compared to steers fed the DRC-HMC diet or the RO-DDGS diet. Steers fed the DRC-HMC diet had the same dry matter intake, ADG, and feed:gain as steers fed the RO-DDGS diet. These results indicate that feeding RO-DDGS has a lower energy value and will reduce ADG and feed conversion compared to NF-DDGS. However, the RO-DDGS source used in this study still contains similar energy content compared to corn, and provides growth performance and carcass characteristics equivalent to feeding a dry-rolled and high moisture corn diet. These results suggest that the energy value of RO-DDGS is decreased by 8.5% compared to NF-DDGS, based on differences in feed conversion. However, the energy feeding value of RO-DDGS is equal to corn indicating that it is still a more economical energy and protein source than corn.

Using the NRC (1996) model to estimate relationships between feedlot cattle growth performance and diet composition, an estimate for NEg can be calculated for RO-DDGS and used to estimate the impact of the degree of oil extraction in DDGS relative to energy value. Using data from Gigax et al. (2011), for each 1 percentage point decrease in oil content of DDGS (12.9% crude fat used in this study), NEg decreases up to 1.3%. Until more research is conducted on growth performance effects and impacts on energy value in feedlot cattle, this relationship is the best estimate available for adjusting RO-DDGS price.

Table 1. Growth performance and carcass characteristics of yearling feedlot steers fed diets containing corn (dry-rolled and high moisture), reduced-oil DDGS (RO-DDGS), and normal-fat DDGS (NF-DDGS).

	DRC-HMC[1]	RO-DDGS[2]	NF-DDGS[3]
Initial body wt., kg	403	402	402
Final body weight, kg[4]	587[a]	587[a]	604[b]
Dry matter intake, kg/day	11.1	11.1	11.1
ADG, kg	1.55[a]	1.55[a]	1.68[b]
Feed:Gain	7.19	7.19	6.58
Hot carcass weight, kg	370[a]	370[a]	380[b]
Marbling score[5]	614	591	617
12th rib fat, mm	11.9	13.2	13.5
Loin muscle area, cm2	864.2	831.5	845.4

[1]DRC = dry-rolled corn, HMC = high moisture corn.
[2]RO-DDGS contained 6.7% crude fat (dry matter basis).
[3]NF-DDGS contained 12.9% crude fat (dry matter basis).
[4]Calculated from hot carcass weight adjusted to a 63% yield.
[5]450 = Slight 50, 500 = Small 0
[a,b]Means with different superscripts are different ($P < 0.05$).

References:

Gigax, J.A., B.L. Nuttleman, W.A. Griffin, G.E. Erickson, and T.J. Klopfenstein. 2011. Performance and carcass characteristics of finishing steers fed low-fat and normal-fat wet distillers grains. Nebraska Beef Cattle Report, University of Nebraska-Lincoln, p.44-45.

National Research Council. 1996. Nutrient requirements of beef cattle. 7th revised edition. National Academy Press, Washington, D.C.