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Maximizing partially de-oiled DDGS in feedlot diets

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This issue examines whether abundant, less expensive partially de-oiled DDGS can replace costly corn at high levels while reducing feedlot cost of gain.

A large corn harvest, strong ethanol production in a high-fuel-cost market, and expanding output of distillers grains could create an unusual feed-pricing opportunity. Corn may remain expensive as an energy ingredient while plentiful DDGS becomes increasingly attractive. Under those conditions, the question is no longer whether DDGS belongs in a finishing diet. It is how far today's partially de-oiled product can be pushed before declining performance or nutritional constraints consume the price advantage.

A working range of approximately 20% to 30% DDGS on a diet dry-matter basis provides a useful starting point, but historical recommendations reflected more than oil content. Sulfur, product form, grain processing, and economics also mattered. Conventional corn DDGS contained roughly 10% to 13% oil. That full-oil product is no longer the mainstream output of many U.S. ethanol plants because corn oil is now commonly recovered before drying. Modern DDGS frequently contains considerably less oil, although values vary among plants and loads. Lower oil can ease dietary fat constraints, but the scope for replacing more corn still depends on the product's actual nutrient profile and the rest of the finishing diet. The buying decision therefore rests on the delivered DDGS discount relative to corn, rather than on a supply forecast alone.

Begin with replacement value

DDGS replaces more than corn. At lower inclusions, it can supply supplemental protein while also replacing grain. Once protein requirements have been met, additional DDGS is valued primarily as an energy ingredient. Compare delivered prices on a dry-matter basis after crediting displaced corn, protein supplements, and supplemental phosphorus. Preserve adequate physically effective fiber; any roughage reduction requires a separate assessment. Fiber concentration alone does not establish its capacity to stimulate chewing. A large discount may favor more DDGS than the inclusion producing maximum daily gain.

Recalculate feeding value

Oil extraction removes concentrated energy. A 2026 Nebraska summary placed feeding value near 103% of corn for partially de-oiled DDGS and 113% for full-fat DDGS, with substantial uncertainty around the estimates. These are performance-derived feeding values for replacing dry-rolled or high-moisture corn, not measured energy concentrations. The de-oiled DDGS estimate covered four experiments and 272 cattle. Changes over time also complicate attributing the entire difference to oil removal. Use these figures as reference points: product composition, inclusion rate, and grain processing matter. Wet and modified products require separate values.

Higher inclusion can remain economical

Research has evaluated dry, wet, and modified distillers grains at 30% to 40% of diet dry matter and beyond, but their results are not interchangeable. De-oiled DDGS has been fed at 50% in a Nebraska meat-quality study; that does not establish a profitable or generally safe maximum. At higher inclusions, cheaper feed may offset slower gain. The calculation must include additional days on feed, yardage, financing, and changes in carcass receipts. Compare margins at a comparable finishing endpoint, rather than feed cost alone. A large discount can justify testing higher inclusion, provided nutritional constraints and the full cost of finishing remain acceptable.

Treat sulfur as a principal constraint

At high inclusion, sulfur may limit DDGS before energy does. Distillers grains concentrate sulfur entering the ethanol plant, and processing may add more. Total sulfur includes contributions from DDGS, other ingredients, and drinking water. Excess sulfur can depress performance and increase the risk of sulfur-associated polioencephalomalacia. Guidance places the maximum tolerable concentration near 0.30% of diet dry matter in high-concentrate diets. This is a formulation limit, not a guarantee of safety: water intake, adaptation, and rumen conditions affect risk. Include water sulfur on an equivalent diet dry-matter basis and use current analyses, followed by monitoring and readjustment where necessary.

Account for nutrients cattle do not need

High DDGS inclusions can exceed finishing cattle requirements for crude protein and phosphorus. Adjust calcium supplementation as dietary phosphorus increases. Surplus nitrogen must be excreted, while phosphorus loading and manure-management obligations may increase. Higher-protein diets can also raise water consumption and urinary output. These costs can alter the true economic optimum. DDGS should receive credit for replacing needed nutrients only until they cease to have value.

Establish the local optimum

Analyze each source for dry matter, crude protein, fat, sulfur, phosphorus, and fiber; include water sulfur; and reformulate the complete diet. Where nutritional constraints permit, compare perhaps 30%, 35%, and 40% DDGS against the current diet, all on a dry-matter basis. Increase inclusion deliberately while monitoring intake, gain, feed conversion, bunk behavior, manure, and health. Use comparable cattle and allow enough time to distinguish sustained performance from adaptation effects. High inclusion is already supported by research under specific conditions. The economic hypothesis to test is whether it improves the finishing margin with this source, these cattle, and local prices.

In Brief, abundant, discounted, partially de-oiled DDGS could help offset expensive corn. A 20% to 30% working range need not be the endpoint. Lower oil can ease fat constraints while reducing feeding value; sulfur, effective roughage, excess protein and phosphorus, and ingredient variability still matter. Choose the inclusion that improves the finishing margin after accounting for performance, time, and carcass value, without unacceptable health or environmental costs.

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