

**DBT Study Title:** Livestock Feeding Study

**Dow AgroSciences LLC Study Title:** Nutritional Equivalency Study of Cry1F/Cry1Ac Cottonseed Meal: Poultry Feeding Study, Unpublished Report of Dow AgroSciences LLC (Study ID 021309).

## Introduction

This study was conducted to determine the nutritional equivalency of cottonseed meals derived from Cry1F/Cry1Ac cotton, a related non-transgenic isoline cotton and two sources of commercial cotton following 42 days of dietary exposure to broiler chickens.

**Quality Assurance.** The study conduct, data, protocol, protocol changes/revisions, and final report were inspected by the Quality Assurance Unit of Solution BioSciences, Inc., Salisbury, Maryland.

**Archiving.** Raw data and the original copy of the final report are archived at The Dow Chemical Company, Midland, Michigan.

## Materials and Methods

**Study Site.** Solution BioSciences, Inc. Tyaskin, Maryland.

**Selection of Animal Species.** Commercial-type broiler chickens (Cobb X Cobb breed) were procured at their day of hatch from Mountaire Hatchery (Princess Anne, Maryland).

**Animal Housing.** Ten broilers/pen were randomly placed into 48 individual growout pens in a single poultry house and grown under practical commercial conditions from Trial Day 0 (their day of hatch) to 42 days of age (Trial Day 42).

**Study Groups.** A total of 480 male and female broiler chickens in 12 blocks of 10 broilers each (5 male and 5 female) were fed diets containing 10% cottonseed meal from Cry1F/Cry1Ac cotton (DOW01-4), non-transgenic cotton (DOW01-3) or one of two commercial lines (DOW01-1 AND DOW01-1) for 42 consecutive days (Table 1).

**Clinical Observations.** Broilers were observed 3 times daily beginning on Trial Day 0 to determine mortality or the onset, severity, and duration of any behavioral changes or evidence of toxicity.

**Body Weights and Body Weight Gain.** Body weights of individual birds were taken on Trial Days 0, 21, 28 and 42. Body weight gain for the ending of each period was calculated by subtracting the beginning weights (Trial Day 0) from the ending weights for each period.

**Mortality.** Mortality was checked on a daily basis.

**Food Consumption and Feed Conversion.** Food consumption was evaluated for each pen for each phase of production (Trial days 0-21, 0-28, 0-42). Feed conversion was calculated as feed consumption divided by body weight gain for each period.

Table 1. Test Groups and Treatments

Test Group	Test/Control Substance	No. of Blocks	No. of Broilers per Block	Total No. Broilers per Test Group
DOW01-1	Commercial Control #1	12	10 (5 Male + 5 Female)	120
DOW01-2	Commercial Control #2	12	10 (5 Male + 5 Female)	120
DOW01-3	Non-Transgenic Isoline Cotton Control	12	10 (5 Male + 5 Female)	120
DOW01-4	Cry1F/Cry1Ac Cotton	12	10 (5 Male + 5 Female)	120

Statistics. Analysis of Variance (ANOVA) was used to compare parameter means from all test groups. Means were further separated using Least Significant Difference. Significant differences found at the  $p < 0.05$  level were reported.

### Results

Table 2 shows results for mortality, body weight gain and feed conversion for broilers over the entire duration of the study (Trial Days 0 to 42).

Cottonseed Meal from Cry1F/Cry1Ac Cotton vs. Cottonseed Meal from a Non-Transgenic Isoline. No statistically significant differences were observed in mortality, body weight gain or feed conversion between broilers fed a diet containing cottonseed meal from Cry1F/Cry1Ac or cottonseed meal from a non-transgenic isoline cotton.

Cottonseed Meal from Cry1F/Cry1Ac Cotton vs. Cottonseed Meal from Commercial Sources. No statistically significant differences were noted in mortality or body weight gain between groups of broilers fed diet containing cottonseed meal from Cry1F/Cry1Ac cotton or cottonseed meal from commercial sources. Feed conversion by broilers fed cottonseed meal from one of the two commercial sources (DOW01-1) was found to be statistically worse than that of broilers fed cottonseed meal from Cry1F/Cry1Ac. No differences in feed conversion were seen between broilers fed cottonseed meal from the second commercial source (DOW01-2) and those fed cottonseed meal from Cry1F/Cry1Ac.

### Conclusion

These results confirm the nutritional equivalence of cottonseed meal derived from Cry1F/Cry1Ac cotton, a non-transgenic isoline cotton (non-GM cotton) and two sources of commercial cotton when fed to broiler chickens for 42 days.

**Table 2. Broiler chicken performance study (Performance Means over Trial Days 0-42)**

Parameter	DOW01-1 (Commercial Control #1)	DOW01-2 (Commercial Control #2)	DOW01-3 (Non-Transgenic Isoline Control)	DOW01-4 (Cry1F/Cry1Ac Cotton)
Initial Weight Statistical Comparison <sup>2</sup>	51.44 ab	51.47 ab	51.81 a	51.11 b
Final weight Statistical Comparison <sup>2</sup>	1904.21 a	1920.92 a	1924.3 a	1926.16 a
Feed Conversion <sup>3</sup> Statistical Comparison <sup>2</sup>	1.858 b	1.845 ab	1.846 ab	1.819 a
Mortality % Statistical Comparison <sup>2</sup>	0.833 a	0.833 a	1.667 a	0.833 a
Average Gain Statistical Comparison <sup>2</sup>	1852.766 a	1869.455 a	1872.496 a	1875.054 a

<sup>1</sup> All weights shown are in grams. Mortality is shown as percentage.

<sup>2</sup> Means in a row without a common superscript are statistically different ( $P < 0.05$ ) as determined by Least Significant Difference.

<sup>3</sup> Feed conversion corrected by including data for any birds that died at some time during the study duration.