



Title

**The Effect of Glufosinate Resistant Corn
on the Growth of Male Broiler Chickens**

Author

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Report No.

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Date

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This study was conducted for Aventis (then AgrEvo) in 1996. It was the only feeding study conducted using whole grains of genetically modified Chardon LL maize, a variety of T25 maize developed by Aventis. It was used in the application to grant Aventis a licence to market Chardon LL.

For Friends of the Earth's case against Chardon LL maize see:

www.foe.co.uk/campaigns/food_and_biotechnology/information/gm_food/

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Signature

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This study was conducted according to SOP's as established by the Arkell Poultry Research Farm.

Signature Project Director

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Introduction:

Corn can be utilized as a major component of broiler chicken diets. This study was conducted to compare the performance of broiler chickens fed glufosinate resistant corn with a standard commercially available corn hybrid.

The growing broiler is a very sensitive test species as a 15 fold increase in body weight occurs during the first 18 days. Therefore, the broiler is an appropriate species to detect differences in nutrient quality of corn samples. This is a report referring to the experimental protocol **C-5-96** examining the data obtained from treatments utilizing corn hybrid genetically modified to be resistant to the herbicide glufosinate ammonium (T25 derived lines) and commercial corn hybrid sources in diets for male broiler chickens.

Materials and Methods:

Two hundred and eighty commercial strain Ross x Ross male broiler chickens were obtained at day of age. Birds were weighed and allocated at random to 1 of 2 treatment groups, replicated 4 times, 35 birds per replicate. Replicates were randomized over 8 floor pens each measuring 1.8 m x 2.4 m. Birds were maintained at a brooding temperature of 32 C 5 days and then environmental temperature gradually reduced to 22 C in keeping with normal brooding practice. Constant lighting was used throughout the study. Birds were cared for by Agricultural Assistants at the Arkell Poultry Research Station and according to the required guidelines of the Canadian Council on Animal Care and with the approval of the University of Guelph Animal Care Committee, Animal Utilization Protocol #96R072.

Birds were reared on 1 of 2 diets, *ad libitum*, as prepared at the Arkell Research Station Feed Mill. Each diet treatment was prepared for starter, grower and finisher periods and are conventional corn-soybean type diets commonly used in Southern Ontario and these treatments vary only in the source of corn used in each diet. The source of corn for the first diet is University of Guelph and for the second diet AgrEvo U.S.A., Inc. The percentage diet composition of diets 1 and 2 for starter grower and finisher is presented in Appendices 1, 2 and 3. Birds were fed starter diets to 18 days at which time feed intake was measured and all birds weighed individually. Grower diets were fed between 18 and 32 days at which time feed intake was measured and all birds weighed individually. Finisher diets were fed between 32 and 42 days of age and again feed intake measured and all birds weighed individually. All occurrences of mortality were submitted to the Ontario Veterinary college, Department of Pathology for post-mortem examination (Appendix 4).

On day 42, 8 birds were randomly selected from each pen for processing at the University's plant. Birds were eviscerated and the abdominal fat pad was removed and weighed.

Carcasses were chilled in water overnight (approximately 16 hours) weighed and then right and left breast muscle (consisting of the pectoralis and the supracoracoideus muscles) removed and weighed.

Statistical analysis:

The data collected and calculated were considered by a T-test procedure appropriate to 2 levels of treatment and classification. The response variables considered were initial body weight, 18, 32 and 42 day body weight, 0-18, 18-32, 32-42, and 0-42 day body weight gain, feed intake, and feed intake:body weight gain. Carcass characteristic considered were chilled carcass weight, abdominal fat pad weight, total deboned breast meat yield and abdominal fat pad as a percent of carcass weight and deboned breast meat yield as a percent of carcass

weight. Percent mortality over the experimental period was calculated. Significance was accepted at $P < .05$.

Results:

Results of live bird traits are presented in Tables 1 and 2 and show that source of corn in starter, grower and finisher diets had no effect on body weight, feed intake, feed intake:body weight gain or percent mortality over the experimental period ($P > .05$). Mortality was normal for this fast-growing strain of bird, where at our research facilities we normally see values of 5 to 8% in male broilers. As shown in Appendix 4, there was no infectious disease, with most mortality being caused by metabolic disorders which are accentuated by fast growth rate. Carcass characteristics measured and calculated were unaffected by source of corn in the experimental diets and are shown in Table 2.

Conclusions:

Glufosinate tolerant corn from the U.S.A. is comparable in feeding value, for 0-42 day broilers, relative to the commercially available corn hybrid. Therefore, the nutritive value of the glufosinate tolerant corn hybrid is equivalent to a commercially available corn hybrid.

Table 1. Individual male broiler response to new cereal varieties -corn.

Treatment	Initial Body Weight (g)	18 day Body Weight (g)	32 day Body Weight (g)	42 day Body Weight (g)	Body Weight Gain 0 - 18 day (g)	Body Weight Gain 18-32 day (g)	Body Weight Gain 32-42 day (g)	Body Weight Gain 0-42 day (g)
Commercial corn Hybrid	41.6±0.6	618±12.2	1636±26.6	2501±36.6	577±12.3	1018±14.5	865±13.8	2459±36.8
Glufosinate resistant corn (T25)	41.2±0.6	624±15.5	1652±49.8	2483±90.6	583±16.1	1029±38.6	831±42.5	2442±91.0
Significance (at P<.05)	NS	NS	NS	NS	NS	NS	NS	NS

NS - Not Significantly different

Table 1 Continued..... Individual male broiler response to new cereal varieties - corn.

Treatment	Feed Intake 0-18 day (g)	Feed Intake 18-32 day (g)	Feed Intake 32-42 day (g)	Feed Intake 0-42 day (g)	Feed Intake:Body Weight Gain 0-18 day	Feed Intake:Body Weight Gain 18-32 day	Feed Intake:Body Weight Gain 32-42 day	Feed Intake:body Weight Gain 0-42 day
Commercial corn Hybrid	788±12.8	1752±17.7	1759±20.8	4310±35.8	1.39±0.01	1.72±0.01	2.03±0.04	1.75±0.02
Glufosinate resistant corn (T25)	797±17.0	1745±46.1	1696±71.0	4239±123.8	1.37±0.02	1.70±0.02	2.04±0.03	1.74±0.01
Significance (at P <.05)	NS	NS	NS	NS	NS	NS	NS	NS

NS - Not significantly different

Table 2. Individual male broiler response to new cereal varieties - corn.

Treatment	Carcass Weight (g)	Abdominal Fat Pad Weight (g)	Deboned Breast Meat Yield (g)	Abdominal Fat Pad as Percent of Carcass Weight	Deboned Breast Meat Yield as Percent of Carcass Weight	Mortality 0-42 day (%)
Commercial corn hybrid	1832±164	54.3±15.1	362±46.0	2.95±0.76	19.7±1.88	3.57±4.29
Glufosinate resistant corn (T25)	1827±231	56.0±15.2	365±56.6	3.11±0.90	20.1±2.57	7.14±5.47
Significance (at P<.05)	NS	NS	NS	NS	NS	NS

NS Not significantly different

APPENDIX 1.

**Percentage Diet composition
Starter Diet**

Ingredient	Percent
Corn - Glufosinate resistant or standard commercial hybrid	56.88
Soybean Meal	35.38
A-V Fat	3.43
Dicalcium Phosphate	1.45
Limestone	1.46
Vitamin #1	0.500
Mineral #1	0.250
DL-Methionine	0.19
L-Lysine	0.005
Salt	0.34
Stafac	0.05
Coban	0.075
Calculated Analysis	
ME kcal/kg	3067
Crude Protein %	21.99
Met %	.55
Lys %	1.25
Av.P. %	0.41

APPENDIX 2.**Percentage Diet Composition
Grower Diet**

Ingredient	Percent
Corn - Glufosinate resistant or standard commercial hybrid	61.01
Soybean Meal	30.49
A-V Fat	4.33
Dicalcium Phosphate	1.39
Limestone	1.39
Vitamin #1	0.500
Mineral #1	0.250
DL-Methionine	0.18
L-Lysine	0.005
Salt	0.33
Stafac	0.05
Coban	0.075
Calculated Analysis	
ME kcal/kg	3148
Crude Protein %	19.99
Met %	.51
Lys %	1.10
Av.P. %	0.39

APPENDIX 3.

**Percentage Diet Composition
Finisher Diet**

Ingredient	Percent
Corn - Glufosinate resistant or standard commercial hybrid	66.10
Soybean Meal	25.27
A-V Fat	4.63
Dicalcium Phosphate	1.34
Limestone	1.31
Vitamin #1	0.500
Mineral #1	0.250
DL-Methionine	0.19
L-Lysine	0.075
Salt	0.34
Stafac	
Coban	
Calculated Analysis	
ME kcal/kg	3210
Crude Protein %	17.98
Met %	.50
Lys %	1.00
Av.P. %	0.38