

VALUE OF DDGS IN POULTRY DIETS

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Use of DDGS in Poultry Diets

- **Source - Unidentified Growth Factor**
 - Low levels of inclusion (LT 5%)
 - Enhancement of growth or reproduction
 - Feed intake or palatability effect
- **Protein supplement**
 - Higher levels of inclusion

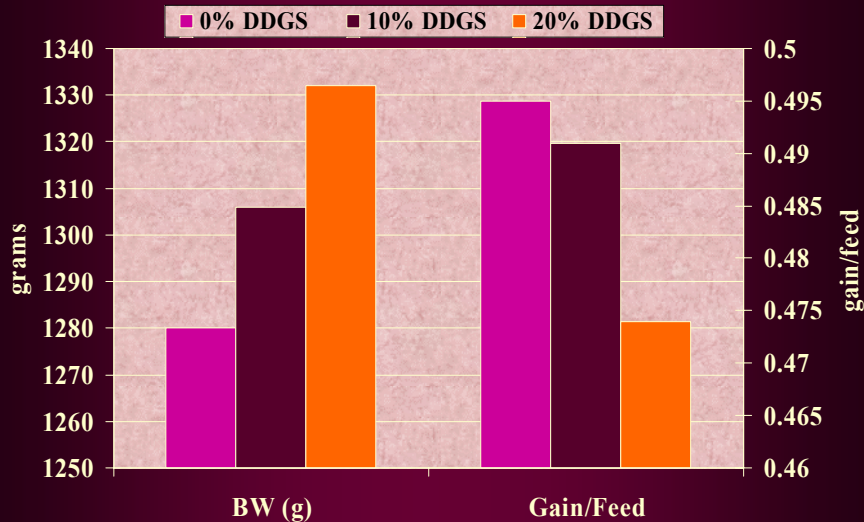
Unidentified Growth or Hatchability Factor

- **Growth response (Couch et al., 1957)**
 - 5% DDGS in turkey diets
 - 17-32% improvement in gain
- **Feed preference (Alenier & Combs, 1981)**
 - 10% DDGS in chicken layer diets
- **Reproduction improvement (Manley, 1978)**
 - 3% DDGS in turkey breeder hen diets
 - improvement in egg numbers and hatch (late lay)

As Protein Supplement

- **Limiting amino acids (Parsons et al., 1983)**
 - Lys
 - Tryp
 - Arg (perhaps equally limiting with tryp)
- **Lys and energy adjustments with inclusion**
 - growth
 - feed conversion

Turkey Poults 8 Weeks, Potter 1966



Performance Response of Broiler Chickens (0-42 days) to DDGS in Diets Adjusted and Not Adjusted for Energy

DDGS Inclusion Level (%)	BW (g)		Gain/Feed	
	Fixed Energy	Variable Energy	Fixed Energy	Variable Energy
0	1288	1206	.513	.493
5	1237	1227	.518	.505
10	1237	1203	.508	.490
15	1220	1165	.513	.444*
20	1246	1164	.498	.467
25	1247	1096*	.500	.446*

* Different from control

Lysine Availability (%)

Source	Lysine Bioavail.	Lysine Digest.
Combs & Bossard (1969)	71-93	----
Parsons (1983)	66	82
Heartland (1998)	----	57

Why Conduct Research on DDGS?

- **Limited current information on use for turkey growth and meat yield**
- **Limited information on current DDGS**
- **How does it fit in with other available ingredients such as canola meal?**

Specific Experimental Objectives

- Determine if significant inclusion of canola and DDGS affects turkey meat yield
- Determine potential for limiting amino acids other than lysine and methionine
- Evaluate diet response in warm and cool rearing conditions
- Determine amino acid digestibility of DDGS and other alternative ingredients

Ingredient Amino Acids (% of Protein)

AA	SBM	Corn	MBM	Canola	DDGS
M+C	3.0	4.6	2.4	4.3	4.2
Lys	6.2	3.0	5.4	5.5	2.8
Iso	4.3	3.2	3.0	3.6	3.6
Arg	7.2	5.0	6.7	6.0	4.4
Tryp	1.5	0.9	0.7	1.5	0.8
Thr	4.0	3.5	3.2	4.2	3.8
Val	4.6	4.8	3.8	4.8	4.8

Methods

- **980 male turkey poults randomized into 98 pens at 5 wks of age**
- **Room temperature**
 - Warm - 70 F
 - Cool - 70 to 60 to 50 F
- **7 replicate pens/trt or 70 poults/trt**

Methods/Measurements

- **Weights and feed intakes at 8, 11, 14, 17 and 19 wks of age**
- **Carcass and Meat yield**

Methods Continued

- **Treatments**
 - 1. Control - corn, SBM, MBM
 - 2. As 1 plus DDGS
 - 3. As 1 plus canola
 - 4. As 1 plus DDGS and canola
 - 5. As 4 plus tryp to Trt 1
 - 6. As 4 plus tryp, iso to Trt 1
 - 7. As 4 plus tryp, iso, arg to Trt 1

Ingredient Analyses

- **Proximates, minerals, amino acids**
- **Digestible amino acids**
- **Formulation - digestible amino acids, and isocaloric**

Ingredient Analyses

Nutrient	Corn	SBM	MBM	Canola	DDGS
Protein	7.56	46.77 [%]	58.11	37.12	26.39
Fat	4.67	2.31	11.37	3.45	11.51
Fiber	1.70	2.47	.51	10.15	6.17
Met	.15	.63	.99	.65	.49
Cys	.16	.64	.53	.77	.53
Lys	.22	2.69	2.99	1.71	.81
Tryp	.05	.60	.47	.45	.24
Val	.36	2.03	2.19	1.48	1.36
Thr	.24	1.50	1.81	1.23	1.00
Iso	.25	1.93	1.73	1.16	.96

Amino Acid Digestibility (% of total)

AA	Corn	SBM	MBM	DDGS	Canola
	----- % -----				
Met	97.9	94.3	92.3	88.5	90.2
Cys	88.2	-----	84.7	78.4	79.7
Lys	86.2	91.8	90.3	78.6	84.2
Arg	96.1	93.5	94.0	92.5	92.7
Tryp	96.8	93.7	95.1	91.8	98.4
Thr	81.1	84.3	90.1	82.5	81.5
Iso	86.4	90.9	92.2	89.1	85.8
Val	93.3	89.4	90.2	88.1	83.5

Example Diets for 5-8 wk Old Turkey Toms

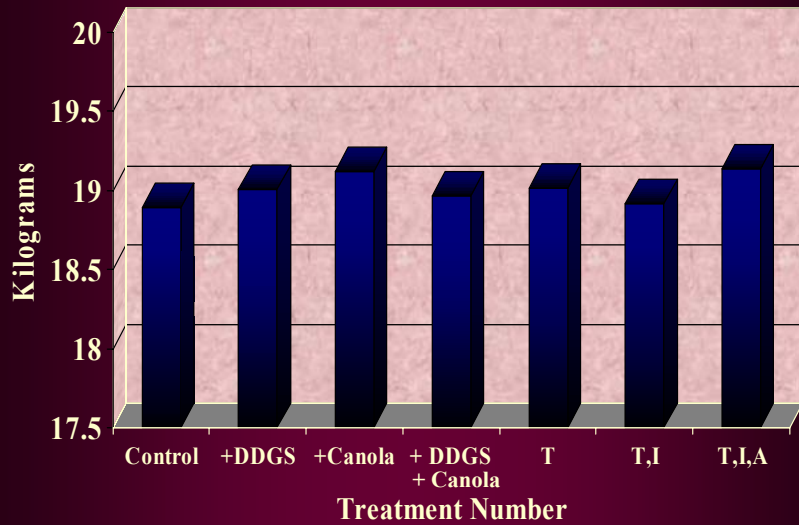
Ingr. %	Trt 1	Trt 2	Trt 3	Trt 4
Corn	60.0	54.1	54.8	49.0
SBM	26.8	20.5	18.7	12.
MBM	8.0	8.0	8.0	8.0
Canola	---	---	12.0	12.0
DDGS	---	12.0	---	12.0
Supp.				
Fat	2.1	2.1	3.6	3.6
Other	+++	+++	+++	+++

Example diets for 5-8 wk old turkey toms

Nutrient,%	Trt 1	Trt 2	Trt 3	Trt 4
Tryp	0.23	0.21	0.23	0.21
Iso	0.79	0.76	0.76	0.73
Arg	1.34	1.24	1.31	1.22
Energy, (kcal/kg)	3070	3070	3070	3070
Prot. (%)	22.7	22.5	22.9	22.7

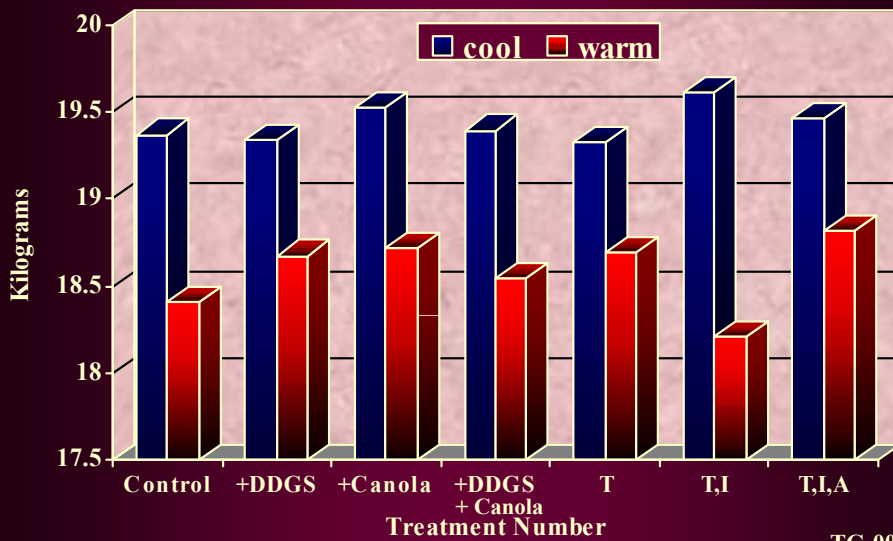
*Lys (1.29%), M+C (.82%), Thr (.79%) and Val (.90%) same in all diets

Market Tom Body Weight at 19 wks



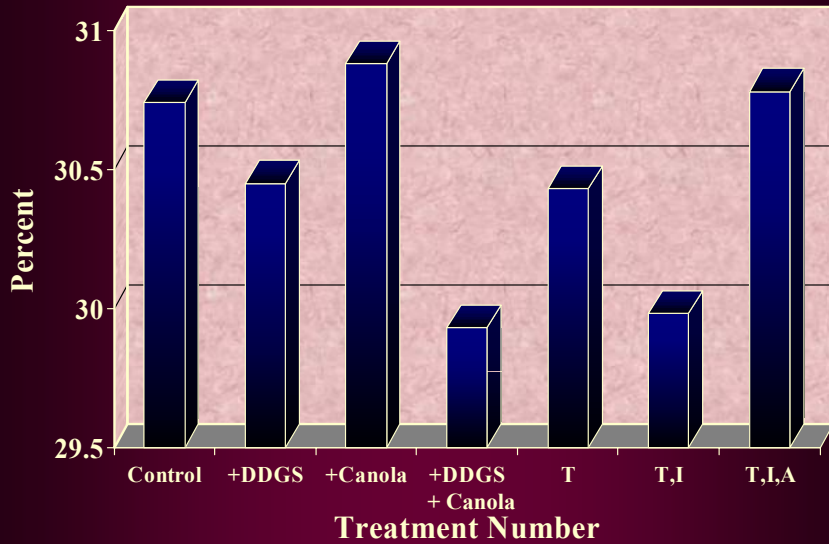
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Effect of Environment on 19 Week Body Weight



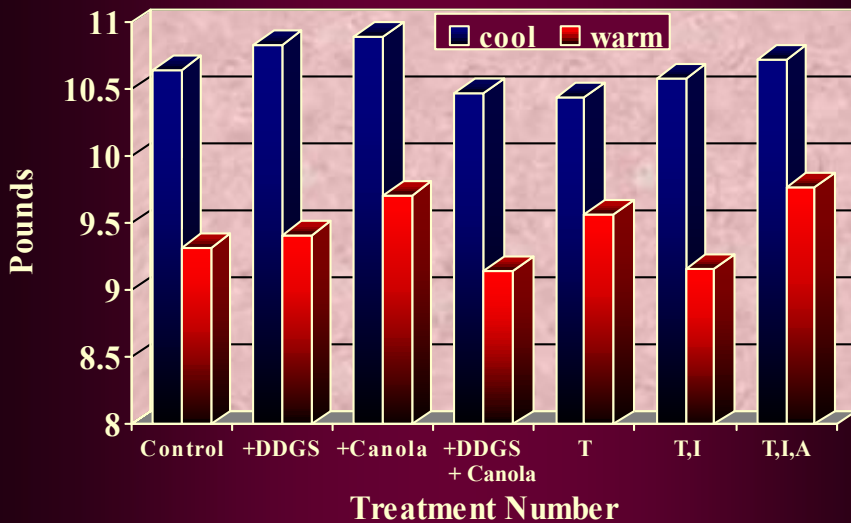
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% Breast Meat Yield - Heavy Toms



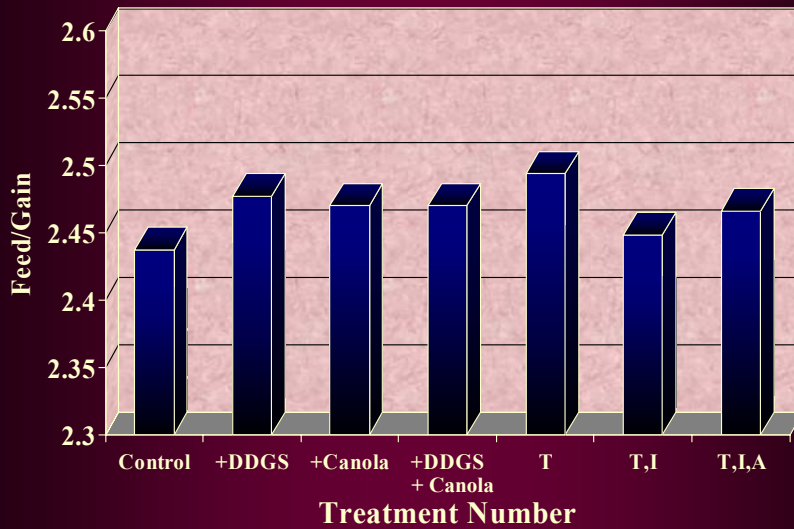
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Effect of Environment on Breast Meat Yield - Heavy Toms



TG-002

Feed Efficiency 5-19 wks



TG-002

Summary

- **Digestibility of DDGS quite improved from book values**
- **Inclusion of 12 % canola or DDGS had little effect on weight or feed:gain**
- **Inclusion of both canola and DDGS slight depression in weight and breast meat yield**

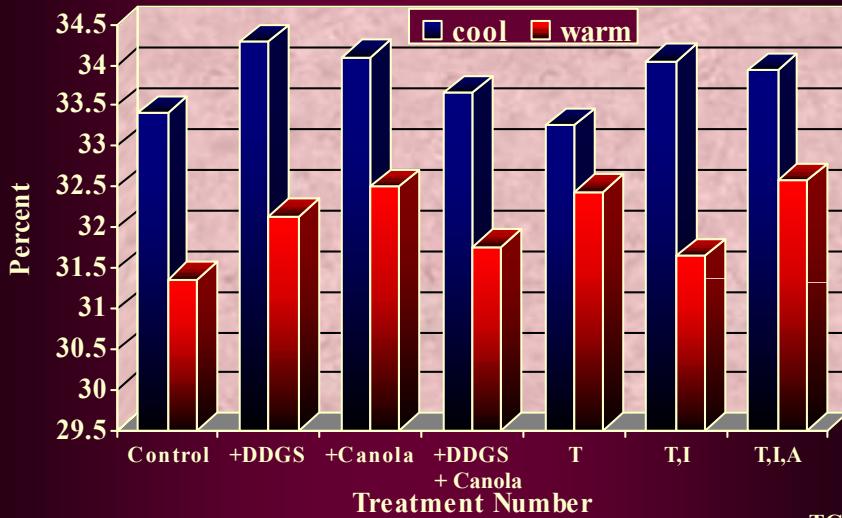
Summary-Continued

- **Utilization of DDGS in turkey diets**
- **Nutrient characteristics as a protein source**
 - **Amino acid digestibility**
 - **Metabolizable energy content**
 - **Phosphorus digestibility**
- **Price of alternative ingredients & supplements**

Summary-Continued

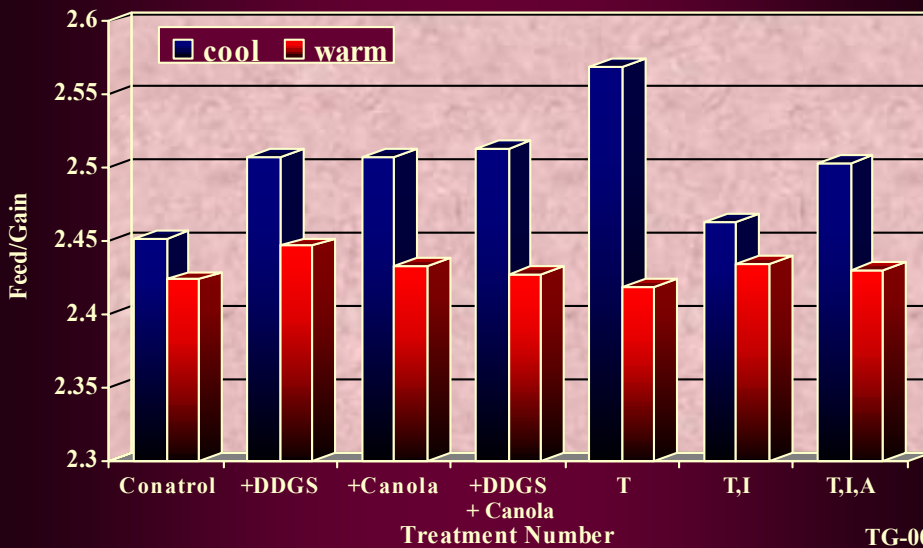
- **Price of alternative ingredients & supplements**
- **Alternative ingredients**
 - **Corn, SBM, MBM, canola meal**
- **Amino acid supplements**
 - **Methionine**
 - **Lysine**
 - **Threonine**
 - **Tryptophan**

Effect of Environment on % Breast Meat Yield - Heavy Toms



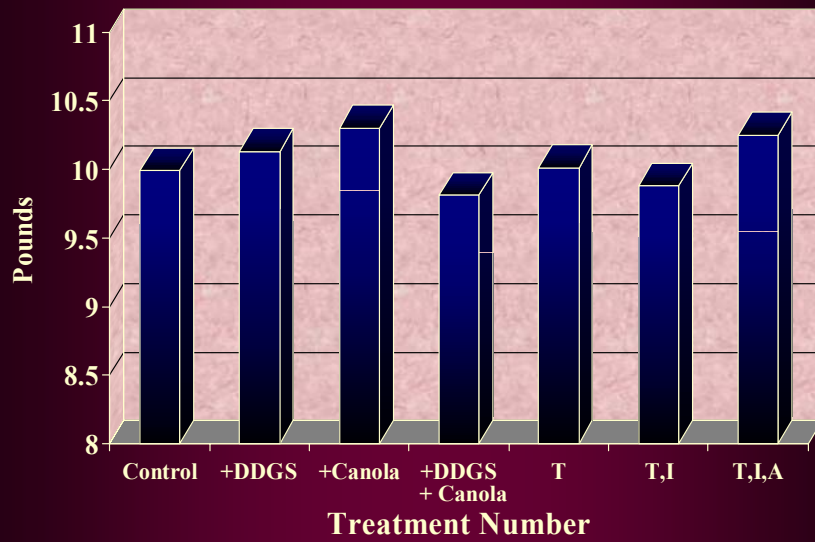
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Effect of Environment on Feed Efficiency (5-19 wks)



TG-002

Breast Meat Yield - Heavy Toms



TG-002