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19: QUALITY EVALUATION OF PIGS FED POULTRY BY PRODUCTS IN THEIR DIET.

P. O. Fakolade [1,*], E. T. Oluwasola [1], T. R. Akinloye [1], S. A. Adeoye [1]

[1]Animal Science, Osun State University, Osogbo, Nigeria

Objectives: The effect of consuming solely animal products in pig diet is the focus of this study. Thirty – six male Large White pig of 6weeks old of ages of 5.7 – 7.5 kg old were fed boiled poultry by products (poultry dead birds and hatchery waste) and compared with the conventional feed from plant source, P.K.C (Palm Kernel Cake)

Materials and Methods: Pigs were reared for 10 weeks, allotted into 3 treatments of 12 pigs per treatment, replicated three times, to evaluate for chemical composition, performance and digestibility studies, carcass and organ evaluation, serum and haematological parameters, physico – chemical analysis and palatability study, in a completely randomized design. Boiled dead birds BDB (T3) and Boiled hatchery waste BHW (T2) were compared with the conventional pig food PKC (T1).

TABLE 1

SERUM BIOCHEMISTRY PARAMETER OF PIGS FED POULTY – BY – PRODUCTS IN THEIR DIET.

	T1	T2	T3	SEM
Glucose (mg/dl)	84.92[a]	80.22[a]	66.63[b]	5.22
Ast)u/l)	13.64	11.50	14.09	3.64
Alt	2.48[b]	3.68[a]	4.24[a]	0.25
Cholesterol (mg/dl)	123.88[b]	336.76[a]	106.80[c]	58.76
Total Protein (g/dl)	9.28[b]	7.73[c]	13.37[a]	0.68
Albumin (g/dl)	5.32[a]	3.96[b]	5.40[a]	0.83
Creatinine (mg/dl)	4.99[a]	1.83[b]	1.50[c]	1.03
Urea (g/dl)	44.06	55.38	52.32	9.54

[a,b,c], means on the same row are significantly different (P,0.05)

Results: T1 had significant highest values for fasted, bled, rib, thigh, shoulder, caecum, lungs, spleen, kidney, heart and intestinal weight compared to T2 and T3, but liver weight was significantly highest in T3 follows by T2. Daily weight gain, daily feed intake and body weight gain had highest ($P<0.05$) values of 107.45g. 105.31g and 4513.00g for T1 compared to T2 (37.52g, 63.39g and 1580.00g) and T3 (60.00g, 63.30g and 2500.00g) respectively. Feed Conversion Ratio was observed with the lowest ($P<0.05$) for T1 (0.98), follows by T3 (1.06) and then T2 (1.68). For apparent digestibility, crude fibre, ether extract, dry matter and NFE were ($P<0.05$) highest for T3 follows by T2, but lower for crude protein. T3 perform best in physico – chemical evaluation having the lowest ($P<0.05$) for thermal and cold shortening, cooking loss and thaw rigor but highest ($P<0.05$) value for water holding capacity than for T1 and T2. Lymphocyte values and white blood cell performed best for T3 while T1 had the highest in monophils. T3 had the lowest significant cholesterol value (106.80 mg/dl), than T2 (336.76 mg/dl) and T1 (123.88 mg/dl) while T1 did best ($P<0.05$) in glucose content (84.92 mg/dl), compared to T2 (80.22 md/dl) and T1 (66.63 mg/dl). Protein content had the highest values ($P<0.05$) in T3 followed by T2 in fresh muscle while the revise was observed for ether extract. T2 andT3 made the highest ($P<0.05$) different for palatability score when the muscle were boiled, for flavor, tenderness, juiciness, texture and overall acceptability than T1.

Conclusion: T3 performed best, having the highest value for palatability scored, performance quality, physico – chemical analysis, lowest cholesterol and glucose content.

Keywords: Boiled Hatchery Waste (BHW), Boiled Dead Bird (BDB), Pigs, and Diets.

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20: GENERAL PUBLIC EDUCATION OF FOOD MYTHS AND URBAN LEGENDS: HORMONES, ANTIBIOTICS AND GMOS

D. A. Tigue [1,*], L. Kriese-Anderson [1], R. Pacumbaba [2]

[1]Department of Animal Science, Auburn University/Alabama Cooperative Extension System, Auburn University,

[2]Alabama A&M University/Alabama Cooperative Extension System, Normal, AL, United States

Objectives: Approximately 1% of the American population produces food and fiber for the remaining U.S. population. Most Americans are currently three or more generations removed from the farm and no longer have first hand knowledge of how food and fiber are produced. Additionally, food production has developed into several different breeding and growing methods, all of which compete for market share. This has led to confusion as to the nutrition, health and safety of many food products. The Alabama Cooperative Extension System initiated a Food Myths program in 2014. In 2014, it was geared toward education of how meat is produced in the U.S. for extension agents. In 2015, the program was expanded to explain GMO plants used in food production. The target audience changed as well to all consumers of food and fiber. The objective of these meetings is to educate consumers on how food is produced and help them decipher all of the choices they face when purchasing food.

Materials and Methods: Currently, the Food Myths program is 2 hours in length and explains the various ways food and fiber are produced in the U.S. Participants are encouraged to ask questions throughout the program in order to make the best food and fiber choices for their families. All information presented is research based and presented by extension educators with first hand knowledge of breeding and growing methods used in plant- and animal-based U.S. agriculture.

Results: Through program surveys, 82% of participants indicate their knowledge has increased as a result of attending the Food Myth meetings. Interestingly, though, 70% or more of participants indicated that they would not change their consumption of various types of food after attending the meetings. 47% of participants did indicate that they would read packaging and labels more closely as a result of these trainings.

Conclusion: Food production is a highly debated topic amongst consumers and science-based information is often not part of the conversation. Through these series of meetings, consumers from all sides of the food debate were able to learn the truth about how food is produced and what years of research have proven about different production methods. While the major of these consumers indicated that they learned at these meetings, relatively few indicated that they would change their behavior as a result, showing that these beliefs are deeply rooted and not easily changed.

Keywords: antibiotics, hormones, meat myths

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21: PREDICTING BEEF TENDERNESS AND JUICINESS

H. Henderson [1,*] and H.L Laird, T. Luckemeyer, R.K. Miller, C.R. Kerth, and K. Adhikari,

[1]Texas A&M University, College station, United States

Objectives: The objective of this study was to predict overall consumer liking (OLike) or Warner-Bratzler shear force (WBSF) using either consumer tenderness (OTend) and juiciness (OJuice), trained descriptive tenderness (Tend) and juiciness (Juice) attributes, or WBSF.

Materials and Methods: Data where consumer sensory, trained meat descriptive tenderness and juiciness attributes, and Warner-Bratzler shear force were used. Study 1 used top loin steaks cooked to 58°C or 80°C utilizing a George Forman grill (191°C) or a flat food-service grill (232°C). A second study used Choice beef top loin steaks cooked to 58 or 80°C on a flat electric grill (176°C). Companion steaks were cooked for WBSF (kg). A third study used 60 top loin steaks cooked on an open hearth electric grill (176°C) and served to a trained meat descriptive attribute panel. For study 1, consumers (n=80 per city) were recruited in Portland, OR; Olathe, KS; State College, PA and study 2 recruited 120 consumers per city from Olathe, KS; State College, PA; Portland, OR; and Griffin, GA.

Results: Consumer ratings (n=3,228), Warner-Bratzler shear force values, and 400 trained descriptive attribute values (n=400) were used to develop 13 equations (Table 1). Equation 1 used Tend ratings to account for 24.6% of the variation in WBSF. Inclusion of Juice and their interaction did not appreciably increase the amount of variation accounted for by Equation 3 (R^2=0.25) compared to Equation 1. Equations to predict OLike using Tend, Juice or WBSF had very low R^2. OTend and OJuice were better predictors of OLike (R^2=0.500, 0.492, 0.554 for Equations 10, 11 and 12, respectively) than when Juice, Tender or WBSF were used.

Image:

Table 1. Regression equations to predict WBSF and OLike using trained descriptive attribute or consumer sensory tenderness and juiciness liking variables.

		B values for Dependent Variables								
		Descriptive Sensory Attributes			Consumer Sensory Attributes			Warner-Bratzler Shear		
Equations Listed By Independent Variables	Intercept	Tend[a]	Juice[a]	Tend x Juice	OTend[a]	OJuice[a]	OTend x OJuice	Force, (kg)	R^2	RMSE[b]
Warner-Bratzler shear force, kg										
1	6.27	-0.32							0.246	0.67
2	3.79		-0.10						0.039	0.76
3	5.02	-0.17	0.11	-0.01					0.251	0.67
4	3.13				-0.07				0.039	0.76
5	3.05					-0.05			0.024	0.76
6	3.06				-0.05	0.01	-0.002		0.037	0.75
Consumer Overall Liking[a]										
7	5.06	0.15							0.008	1.96
8	7.51		-0.08						0.003	1.96
9	8.71	-0.06	-0.40	0.024					0.002	1.95
10	2.86				0.61				0.500	1.39
11	2.66					0.63			0.492	1.40
12	1.89				0.44	0.43	-0.02		0.554	1.32
13	7.63							-0.34	0.017	1.95

[a]Tend=descriptive overall tenderness and Juice = descriptive juiciness where 1=extremely tough or dry and 15=extremely tender and juicy, respectively; OTend = consumer sensory tenderness liking, OJuice = consumer sensory juiciness liking, and OLike = consumer sensory overall liking score where 1=dislike extremely and 9= like extremely, respectively.
[b]RMSE = Root Mean Square Error.

Conclusion: WBSF is more highly related to trained descriptive tenderness ratings then to consumer tenderness liking values. Overall consumer liking is difficult to predict using trained descriptive attribute and WBSF values and is most highly related to consumer sensory liking ratings for tenderness and juiciness. Juiciness ratings, either trained or consumer, did not appreciabilty improve predictability of regression equations to predict either WBSF or consumer overall liking.

Keywords: juiciness, tenderness

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22: INFLUENCE OF GROWTH PROMOTING TECHNOLOGIES ON ANIMAL PERFORMANCE, PRODUCTION ECONOMICS, ENVIRONMENTAL IMPACTS AND CARCASS CHARACTERISTICS OF BEEF

M. J. Webb[1,*], D. L. Pendell[2], A. A. Harty[1], R. R. Salverson[1], C. A. Rotz[3], K. R. Underwood[1], K. C. Olson[1], A. D. Blair[1]
[1]Animal Science, South Dakota State University, Brookings, [2]Department of Agricultural Economics , Kansas State University, Manhattan, [3]Agricultural Research Service, United States Department of Agriculture, University Park, United States

Objectives: Objectives of this study were to 1) evaluate growth performance and carcass characteristics, and 2) determine environmental and economic impacts of cattle raised with different levels of growth promoting technology.

Materials and Methods: Angus x Simmental crossbred steer calves (n=120) of a single source were stratified by dam age, birth date, birth weight, and randomly assigned to four treatments with increasing levels of growth promoting technology: 1) no technology (NA; no antibiotics or growth promotants); 2) non-hormone treated (NHTC; NA plus therapeutic antibiotics, tylosin and monensin during finishing); 3) implant (IMPL; NHTC plus 3 implants [suckling, initial finishing, and mid-finishing]); and 4) beta-agonist (IMBA; IMPL plus ractopamine-HCl for 31 d before harvest). At weaning, steers were transported to a backgrounding lot and blocked by initial feedyard body weight to 3 pen replicates per treatment resulting in a randomized complete block design. Following backgrounding, steers were finished in a GrowSafe® feeding system and individual performance data (ADG, DMI, and G:F) were recorded. At harvest, hot carcass weight (HCW) and standard carcass measures were used to obtain USDA Yield Grade (YG) and Quality Grade (QG). To evaluate environmental impact of each treatment, input parameters recorded from three production stages (cow-calf, backgrounding, and finishing) were represented in a Life Cycle Assessment using the USDA-ARS, Integrated Farm System Model to determine greenhouse gas emissions, energy use, water use, and reactive nitrogen loss. Production costs and carcass values were used to determine economic impacts of each treatment.

Results: Steers in the IMPL and IMBA treatment had heavier ($P < 0.01$) final calculated body weight and HCW than NA and NHTC. Steers in IMPL and IMBA had greater ($P < 0.01$) DMI than NA, which was greater ($P < 0.01$) than NHTC. Steers in the IMPL treatment had the greatest overall ADG, followed by IMBA, and NA and NHTC had the lowest ADG (2.11, 1.79, 1.54 and 1.45 kg/d respectively; $P < 0.01$). Gain to feed was greatest ($P < 0.01$) for IMPL while IMBA, NHTC, and NA were similar ($P > 0.05$). There were no differences among treatments for YG. Treatments with less technology (NA and NHTC) had greater ($P < 0.01$) marbling scores than IMPL and IMBA however, there was no difference ($P > 0.05$) in the distribution of carcasses in each QG category. Compared to NA, IMPL reduced carbon footprint (CO_2e/kg HCW) by 8%, energy use (MJ/kg HCW) by 6%, water use (kg H_2O/kg HCW) by 4%, and reactive nitrogen loss (g N/kg HCW) by 8%. Compared to NA, IMBA reduced carbon footprint by 1%, energy use by 3%, and reactive nitrogen loss by 2%. The NA and NHTC treatments were similar in environmental outputs and resource utilization. Total cost of gain ($/kg) was greater ($P < 0.01$) for NA and NHTC than IMPL and IMBA. When branded carcass premiums were applied, NA and IMPL had a higher value than NHTC and IMBA ($P < 0.01$). Net return was greatest ($P < 0.01$) for NA. Steers in the IMPL had a greater ($P < 0.01$) net return than NHTC, which was greater ($P < 0.01$) than IMBA.

Conclusion: Treatments utilizing growth promotant implants with and without beta-agonist produced heavier and more environmentally sustainable carcasses. Economic data suggests carcass premiums associated with NA and NHTC may offer producers greater profitability.

Keywords: beef, feedlot performance, growth promotant, life cycle assessment, technology