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BLOOD GLUCOSE LEVEL AND ORGANOLEPTIC EVALUATION OF THE NATIVE AND UPGRADED NATIVE CHICKEN

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ABSTRACT

The study focused on the evaluation of the Blood glucose and organoleptic attributes of the progeny of Kabir and native chicken as well as progeny of native and native chicken. The parameters included in this study were; live and carcass weight, dressing percentage,
giblets weight, weights of meat cuts, skin and flesh color acceptability, desirability, intensity, texture, tenderness, juiciness, general acceptability.

Results showed that live and dressed weights between the two F1 crosses both fasted and non-fasted showed significantly different, with kabir-native cross showed higher or heavier weights. The result has an economic bearing the fact that fasting before dressing the chicken can be practiced without compromising the dressing percentage. The results on meat cuts, data showed significantly higher for kabir-native F1 cross, except for the weights of heart, wings, head and neck, and feet which showed no significant difference between the two F1 crosses.

Data on skin color did not vary significantly between the two groups of progenies. Flesh color of the meat between the two groups differ significantly with native-native cross significantly higher than the kabir-native cross. Acceptability of the carcass color is significantly higher for the kabir-native F1 considering its color combination of pale pink with yellow tinge color which probably contributed attraction to the meat.

The general acceptability results for the two groups of meat ranges from 3.23±0.92 to 3.85±1.15. The Native-native F1 meat samples had significantly higher than the kabir-native F1 meat samples. The relatively higher sensory scores for native-native F1 meat except on intensity and tenderness could have contributed to the overall appraisal of the meat.

Keywords: Carcass, sensory, progeny, Kabir, native chicken.

INTRODUCTION

The acceptability of poultry muscle as food depends largely upon chemical, physical, and structural changes that occur in muscle as it is converted to meat. During production and management of poultry, ante mortem (pre slaughter) factors not only exert important effects on muscle growth, composition, and development, but also determine the state of the animal at slaughter. Thus, events that occur both before and after death of poultry influence meat quality.

Pre-slaughter handling involves all the activities and processes animals undergo prior to sticking. These activities and processes take place on the farm, during transportation, marketing and at the slaughter plant. Although it takes several days and efforts to raise an animal to desirable age, weight and quality, their condition may change appreciably within few days prior to slaughter which will adversely reduce their weight, affect the meat quality and subsequently reduce profit.

This study aimed to compare the blood glucose content and carcass and sensory characteristics of the native chicken and the progeny of crossing Kabir and native chicken.

MATERIALS AND METHODS

The Sample animals

The sample animals were taken from the two crosses of chicken which are F1 of native × native chicken and Kabir × native chicken. They are about 10 months of age. Prior to extraction of blood, samples of each group of the chicken were subjected to fasting and other were not. Fasting was done for not less than 8 hours. This was being made to determine the level of blood sugars of the chicken whether they are affected by feeding and nutrition. Live weight of the birds before and after fasting were also measured.

Blood sugar extraction

During extraction of blood, the birds were handled by one person while another one was extracting blood at wing web using of syringe. About 3-5 drops of blood is taken from each bird and poured into the glocometer. Blood sugar reading was determined and compared between fasted and unfasted birds as well as blood sugar content of native and upgraded native chicken was compared.

Dressing and Evisceration

Three birds per replicate pen were dressed by cutting the arteries and jugular veins along the region of the throat. After thorough bleeding, the birds were then defeathered after being immersed in scalding water, and then eviscerated.

After evisceration, the body cavity was washed to remove blood clots and

dirt. They were hanged for 20 minutes to remove water before weighing. The weight of the carcass and organs were taken and recorded.

Cutting the Carcass

The fresh carcass per replicate was divided into different cuts and was weighed separately to determine the meat cut-up yield. The cuts were: head and neck, wings, legs or feet, breast rib back, tail back, thigh and drumstick.

Carcass and Sensory Evaluation

The panelists for the carcass and sensory evaluation were composed of 10 faculty members of the university.

The samples were all prepared prior to the evaluation proper. There were 6 samples placed in plates for both carcass and sensory evaluation. Each sample was coded with numbers. The panelists were properly instructed on the manner and mode of scoring the carcass and the baked samples.

RESULTS AND DISCUSSION

A. Blood Glucose Level and meat cuts measurements

The data on blood sugar contents, dressing percentage and cut-up yield is presented in Table 1. The result showed that both fasted and non-fasted birds between native-native and kabir-native crosses are significantly different, with the

kabir-native F1 cross had significantly higher blood sugar contents than the native-native F1 cross. The

result implies that fasting the chicken before dressing or butchering can reduce its blood sugar content. Live and dressed weights between the two F1 crosses both fasted and non-fasted showed significantly different, with kabir-native cross showed higher or heavier weights. The result has an economic bearing the fact that fasting before dressing the chicken can be practiced without compromising the dressing percentage. However, in this study kabir-native cross generally have higher weights and dressing percentage both fasted and non-fasted groups. This can be attributed to the higher live weights of the kabir-native F1. Ahmed et al. (2004) stated that carcass weight was a function of live weight. There is direct correlation of dressed weight with the live weight according to Jaap et al., (1950); Howlider and Rose, (1989).

The results on meat cuts, data showed significantly higher for kabir-native F1 cross, except for the weights of heart, wings, head and neck, and feet which showed no significant difference between the two F1 crosses.

Table 1. The blood sugar contents, dressing percentage, giblets and meat cuts of the two F1 crosses.

Parameters	*Native x Native (Male) - (Female)*		*Kabir x Native (Male) - (Female)*	
	Mean	Std dev.	Mean	Std dev.
Blood sugar content				
Fasted	212.0±12.59		260.67±8.34**	
Non-fasted	276.0±17.92		334.33±21.40**	
Live weight at slaughter (g)				
Fasted	968.33±116.92		1405.0±204.51**	
Non-fasted	935.25±89.43		1480.0±107.14**	

Dressed weight (g)		
Fasted	631.67±117.93	953.67±230.40**
Non-fasted	620.0±74.12	996.2±97.08**
Dressing Percentage		
Fasted	65.23±2.39	67.88±1.92 ns
Non-fasted	66.3±1.98	67.3±1.43ns
Giblets weight (g)		
Gizzard & proventriculus	43.33.0±5.77	60.0±8.6**
Liver	18.33±5.77	36.67±8.66**
Heart	4.33±1.15	5.0±0.02ns
Weight of meat cuts (g)		
Breast	150.0±30.0	226.67±57.95**
Drumstick	96.33±12.06	115.0±15.0**
Thighs	95.0±18.03	128.33±35.47**
Wings	131.67±10.41	138.33±5.77ns
Rib back	65.0±20.0	90.0±25.0**
Tail back	76.67±37.16	121.67±47.25**
Head & neck	73.33±12.58	80.0±8.66ns
Feet	36.67±10.41	38.33±6.89ns

** significant (p≤0.05) ns not significant (p>0.05)

B. Carcass and Sensory characteristics

The degree of acceptability of meat is the basis of its value. Acceptability is dependent on combined effects of appearance, skin and flesh color, and the palatability of the meat in terms of desirability, intensity, texture, tenderness, and juiciness. Table 2 presents the carcass and sensory attributes and the corresponding mean scores and standard deviations of the fresh and baked meat samples of the F1 for both native-native and kabir-native chicken crosses.

Skin and flesh color and acceptability. The carcass characteristics of the meat of native-native chicken and kabir-native chicken progenies was evaluated in terms of skin and flesh color as well as the acceptability in terms of its appearances. Results showed that skin color did vary significantly between the two

groups of progenies. The scores for skin color was in the range of 3. 73±0.34 to 3.89±0.16 classified as “creamy white”. This can be associated with the natural characteristics of most native chicken and kabir to be white colored skin, (Wikipedia, 2000; Esplana, 2004).

Flesh color of the meat between the two groups differ significantly with native-native cross significantly higher than the kabir-native cross. Kabir-native F1 got the mean and standard deviation of 3.23±0.12 categorised as “pale pink” while the native-native F1 meat had 3.84±0.08 under “very pale pink” about to be white color. Acceptability of the carcass color is significantly higher for the kabir-native F1 considering its color combination of pale pink with yellow tinge color which probably contributed attraction to the meat by the panellist. Chen and Sun, (1997) pointed out that yellow or pink color of the meat increases the appearance of the meat. Yellowish or pinkish chicken meat belonged to type II or semi-quality meat which were product of crossing between native and exotic breeds, (Roan and Hou, 1997). thus, kabir-native chicken meat is classified as semi quality meat. Generally chicken is characterized by its white meat.

Desirability. In terms of flavour desirability, the panellist compared and rated the baked meat of the two F1 crosses not significantly different falling within the range of 3.63+2.17 to 4.13±4.02, a “desirable” category.

Intensity. For flavour intensity, the panellist rated the two baked samples as having “pronounced chicken flavour” where the scores ranged from 3.84± 1.64 to 4.05±1.28 which were not significantly different between the two groups of F1

crosses. The result implies that breeding native chicken with the kabir did not alter their flavour intensity.

Texture. For the texture of the meat samples, the panellist rating ranged from 4.10±1.03 to 4.12±0.97 which means not significantly different in the texture between the meats samples of the F1 crosses. The result means that both meat samples are categorically intact.

Tenderness. This sensory attribute is governed by softness to tongue and cheek, resistance to tooth pressure, ease of fragmentation, adhesion of the fibers and residue remaining after chewing (Forrest et al, 1975). On the basis of the perception of tenderness

by the panellists, result showed no significant difference on tenderness of meat between the two groups of F1 crosses. The mean rating scores ranged from 3.54±1.04 to 3.82±0.46 which fall under the category of “acceptable”.

Juiciness. Intramuscular fat and water content contribute to the juiciness of the product. Basically all fluids of the meat integrates during cooking process. During baking major portion of the fluids drips out of the meat and what is retained is released upon

chewing. This retained fluids of the meat provides moist sensation in the mouth, enhance flow of saliva, thus, contributing the apparent juiciness of the meat. The comparison of these two groups of meat differed significantly as perceived by the panellists. Meat of the native-native F1, seemed to be more juicy than the kabir-native F1 cross.

General acceptability. The general acceptability results for the two groups of meat ranges from 3.23±0.92 to 3.85±1.15. The Native-native F1 meat samples had significantly higher than the kabir-native F1 meat samples. The relatively higher sensory scores for native-native F1 meat except on intensity and tenderness could have contributed to the overall appraisal of the meat. The overall acceptability results conforms with the idea of Choprakarn, et al. (2000), that meat qualities of native chickens remains to be the most preferred than the meats of other exotic breeds and improved native chicken. Likewise Horst, (1988), favoured that local chicken are preferred by consumers due to pigmentation, taste, leanness and their availability for special dishes.

Table 2. The carcass and sensory attributes of the two F1 crosses.

PARAMETERS	***Native x Native (Male) – (Female)***	***Kabir x Native (Male) – (Female)***
	Mean Std dev.	Mean Std dev.
Carcass characteristics		
Skin color	3.89±0.16	3. 73±0.34^{ns}
Flesh color	3.84±0.08	3.23±0.12**
Acceptability	4.01±1.26	4.47±1.09**
Sensory characteristics		
Desirability	4.13±4.02	3.63±2.17 ^{ns}
Intensity	3.84±1.64	4.05±1.28^{ns}
Texture	4.12±0.97	4.10±1.03^{ns}
Tenderness	3.54±1.04	3.82±0.46^{ns}
Juiciness	3.97±0.69**	3.17±0.13
General Acceptability	3.85±1.15**	3.23±0.92

** significant (p≤0.05) ^{ns} not significant (p>0.05)

Rating scale: *(Hedonic scale-BAI, 2000)*

Skin color: 1-yellow; 2-yellowish cream; 3-creamy white with tinge of pale yellow; 4-creamy white; 5-white
Flesh color: 1-yellowish pink; 2-pale pink with yellow tinge; 3-pale pink; 4-very pale pink; 5-white
Acceptability: 1-desliked very much; 2-desliked moderately; neither liked nor disliked; 4-liked; 5-very much liked
Desirability: 1-very undesirable; 2-undesirable; 3-slightly desirable; 4-desirable 5-very desirable

Intensity: 1-absence of chicken flavor; 2-noticeable chicken flavor; 3-slightly pronounced chicken flavor;
4-pronounced chicken flavor; 5-very pronounced chicken flavor
Texture: 1-highly disintegrated; 2-moderately disintegrated; 3-disintegrated; 4-intact; 5-whole and intact
Tenderness: 1-highly unacceptable; 2-moderately unacceptable; 3-slightly acceptable; 4-acceptable; 5-highly acceptable
Juiciness: 1-very dry; 2-moderately dry; 3-slightly moist; 4-moist; 5-very moist
General Acceptability: 1-highly unacceptable; 2-moderately unacceptable; 3-slightly acceptable; 4-acceptable;
5-highly acceptable

CONCLUSION AND RECOMMENDATION

Conclusion

1. Based on the result, it can be concluded that kabir and native progeny have significantly higher blood glucose content and slaughter weights compared to native-native progeny.
2. Due to high heritability of body weight of almost all animals as far as improving the weight of native animals is concern, crossing or breeding native with the commercial breed is desirable.
3. Correlationally to the body weights, meat cuts of kabir-native progeny are significantly higher than native-native progeny except for the wings, head and feet which showed no significant difference between the two groups.
4. It can be concluded that breeding/mating kabir with native chicken does not affect skin color, desirability, intensity, texture and tenderness.
5. Based on the results, native chicken especially if still pure native is still the most acceptable in terms of skin color, juiciness and general acceptability.

Recommendation

1. For improvement purposes of native chicken in terms of production efficiency, breeding them with commercial breeds can be undertaken provided that native chicken genetic resource should be maintained and conserved.

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