P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; SP-Issue 4; April 2025; Page No. 95-98

Received: 05-02-2025
Accepted: 11-03-2025

Indexed Journal
Peer Reviewed Journal

Carcass characteristics and meat quality traits of crossbred Hampshire pigs fed on wet and boiled diet

[1]LJ Kakati, [2]JR Bora, [3]J Saharia, [4]A Haque, [5]D Kalita, [6]G Saikia, [7]A Das, [8]M Talukdar, [9]B Borah and [10]RR Saikia

[1]Ph.D. Scholar, Department of Livestock Production and Management, C.V.Sc. Khanapara, Guwahati, Assam, India

[2, 3, 4]Professor, Department of Livestock Production and Management, C.V.Sc. Khanapara, Guwahati, Assam, India

[5]Principal Scientist, AICRP MSP on pig, C.V.Sc. Khanapara, Guwahati, Assam, India

[6]Professor, Department of Animal Nutrition, C.V.Sc. Khanapara, Guwahati, Assam, India

[7]Assistant Professor, Department of Livestock Product Technology, C.V.Sc. Khanapara, Guwahati, Assam, India

[8]Professor, Department of Veterinary Anatomy, C.V.Sc. Khanapara, Guwahati, Assam, India

[9, 10]Assistant Professor, Lakhimpur College of Veterinary Science, Joyhing, Lakhimpur, Assam, India

DOI: https://www.doi.org/10.33545/26180723.2025.v8.i4Sb.1831

Corresponding Author: LJ Kakati

Abstract

Thirty six (36) weaned crossbred Hampshire piglets of average 2 months of age were selected for the experiment. The piglets were divided into three homogenous groups where each group consisted 12 piglets each which were allotted to three experimental groups *viz.*, control (reared on standard conventional feed), T_1 (reared on standard conventional wet feed water:feed @ the ratio of 1:1.5) and T_2 (reared on standard conventional boiled /cooked feed). The standard conventional feed both grower and finisher feed were prepared as per ICAR (2013) recommendation. The study was conducted up to 150 days of age and at the end of the experiment 6 animals from each experimental group were slaughtered to study the effect of feeding wet and boiled feeding on carcass and meat quality traits of pigs. Results showed non-significant (p>0.05) but numerically better pre-slaughter weight, hot carcass weight and dressing percentage in Group T_2. Carcass measurements i.e. carcass length, backfat thickness and loin eye area showed no significant difference. In regards to edible and inedible offal revealed non-significant (p>0.05) difference among the experimental groups.

Keywords: Wet feed, boiled feed, carcass characteristics, meat quality, crossbred Hampshire pig

Introduction

As per 20th livestock census (2019), there are 9.06 million pigs in India which is 1.69 % of the total livestock population. In spite of several opportunities in pig based entrepreneurship, the pig farmers' faces several challenges of in pig farming. Heat processing or boiling of diets modifies the nutrient composition and availability of nutrients by starch gelatinization, protein denaturation. It also helps in inactivation of anti-nutritional factors. (Dellavalle *et. al.*, 1994 and Alonso *et. al.*, 2000a) [7, 3]. Heat processing of the cereal increases digestibility and tends to improve piglet performance, specially at early ages (Aumaitre, 1976; Medel *et al.*, 2002) [4, 12]. The conventional production system is generally thought to be associated with poor animal welfare which results in reduced meat quality (Ngapo *et al*., 2003) [14]. Chae (2000) [6] conducted a study to see the impacts of wet feeding of diets on growth and carcass traits in pigs found that the dressing percentage was not significant between the group fed on wet diet (73.65%) when compared to the control group (74.40%) fed with dry meshed diet. Moreover, the researcher also reported non-significant (p>0.05) relationship between the treatment groups in respect to loin eye area. Wet feeding of diets on growth and carcass traits in pigs does not influence the dressing percentage and loin eye area between the group fed on wet diet (73.65%) when compared to the control group (74.40%) fed with dry meshed diet Chae (2000) [6]. Piglets fed the liquid diet had thicker back fat thickness compared to piglets fed dry pelleted diet during the first two weeks of post-weaning Kim *et al.* (2001) [10]. Borah (2013) [5] found that pigs reared on deep litter system had significantly (p<0.01) larger loin eye area than those reared on conventional system and also opined that rearing condition of pigs influenced the loin eye muscle of cross bred pigs. In view of the above, the present investigation has been hypothesized to study the carcass characteristics and meat quality of crossbred Hampshire pigs fed on wet and boiled feed.

Materials and Methods

Under the supervision of the Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-22, the study was conducted at field level in a

Private Farm named "Ruhini Deka Pig Farm" situated at Duwoni village under Manipur gram panchayat of Morigaon district. The laboratory work was performed at the Department of Animal Nutrition, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-22 during the period from August 2021 to January 2022.

A total of 36 (thirty six) weaned Hampshire crossbred pigs were selected randomly from the littermates of 6-8 piglets maintained at the "Ruhini Deka Pig Farm" complex. After initial adaption of one week, the pigs (56 days old) were randomly divided into three treatment groups depending upon nearness of body weight in such a manner that each group consisted of twelve piglets with equal number of males and females (Table. 1). During the experimental period, the animals were housed in conventional housing system. Each piglet were housed in separate pens having the dimensions of 10 x 9 ft. (approx.) covered and open area provided with feeder and water trough.

Table 1: Experimental Design

Group	Number of Animals	Average Body weight (Kg)	Feeding regime
Control	12 (6 M +6 F)	10.80±0.22	Standard conventional feed
T_1	12 (6 M + 6 F)	10.27±0.29	Standard conventional feed in Wet form
T_2	12 (6 M + 6 F)	10.83±0.34	Standard conventional feed in boiled / cook form

The animals under T_1 group was provided with standard conventional wet feed by mixing of water and conventional ration in the ratio of 1:1.5 to form a paste material as described by Liptrap and Hogberg (1992) [11]. However, the animals of T_2 group were provided with standard conventional boiled /cooked feed. The standard conventional feed both grower and finisher feed were prepared as per ICAR (2013) recommendation. The grower feed was provided to the animals from weaning to attainment of 35 kg body weight and finisher feed was given till the end of the experiment. The ration was provided in two halves *e.g.* morning at 8.00-9.00 am and afternoon 2.00-3.00 pm. The quantity of left over feed was measured and discarded and weigh daily before offering new feed in the morning.

The experiment was continued till 150 days of age. At the end of the experiment, six pigs from each experimental group were slaughtered to study the carcass characteristics and meat quality traits. Pigs intended for slaughter were lairaged and starved for overnight with *ad libitum* drinking water. Pre-slaughter weight of the pigs was recorded in a digital platform balance. Humane method of slaughter was followed. Hot carcass weight was recorded in kg in overhead track balance prior to chilling. Dressing percentage was worked out from the hot carcass weight and pre- slaughter weight.

The expelled blood was collected in a container and weighed in kg. The weight of edible offal *viz.*, heart, liver and kidney were taken immediately after evisceration and expressed in kg. The weight of inedible offal and parts *viz.*, lungs, spleen, alimentary tract, head, fore shank, hind shank were taken immediately after evisceration and expressed in kg.

Carcass length was measured in centimetre. The back fat thickness was measured with a metallic tap scale at the level of first rib, last rib and last lumbar vertebrae. The average of the three measurements was calculated as back fat thickness and expressed in centimetre. Loin eye area is the circumference of *L. dorsi* muscle in between the 10^{th} and 11^{th} rib. The circumference was traced on a tracing paper by placing it against the cut surface of the eye-muscle. The impression area was measured by using a compensating polar planimeter and expressed in cm^2. The weight of wholesale cuts *viz.*, ham, bacon, loin, boston butt, picnic and jowl was recorded in a digital balance and expressed in kg.

The data were statistically analyzed by using design of CRD and RBD with interaction in SAS 9.3 (2013).

Results and Discussion

The results of the present investigation (Table 2) correspond with the findings as reported by O'Meara *et al.* (2000) [16] who reported that pigs on wet diet were 2.5 kg heavier at slaughter than the pigs fed on dry diet. Vázquez *et al.* (2021) [19] also reported that pigs fed on wet diet produced significantly heavier hot carcass weight (90.8 kg) than those fed on dry diet (84.8 kg). The findings of the present experiment are in agreement with results reported by Chae (2000) [6] reported numerically higher dressing percentage in crossbred pigs fed on wet diet (74.40%) than those fed on dry diet (73.65%). Similar findings were also reported by Njoku *et al.* (2015) [15] who reported that pigs on wet diet showed 2% higher dressing percentage than those fed on dry diet. Moon *et al.* (2004) [13] also reported that dressing percent is not affected by wet feeding. The present study is in agreement with the report of Ikurior *et al.* (1992) [9] who observed as carcass length do not differ significantly (p>0.05) when the protein diet is subjected to cooking. Vázquez *et al.* (2021) [19] also reported that wet feeding have no effect on carcass length. The results from the present study are supported by Thomas *et al.* (2016) [18] in respect to loin eye area that varied from 2.4 - 4.3 in^2.

Kim *et al.* (2001) [10] reported that pigs on liquid fed diet had thicker back fat thickness compared to those fed on dry pellet. Contrary to this, Moon *et al.* (2004) [13] reported non-significant relationship between pigs fed on wet feed diet and pigs on dry commercial diet. Similar finding was also reported by Hurst D. *et al.* (2008) [8] who found that liquid feeding at different water: feed ratio viz. 1:1.5, 1:3 did not improved (p>0.05) back fat thickness (10.30 mm, 10.40 mm) as compared to dry ration (10.30 mm). The findings of the present study corroborate the works done by the previous workers. There is no literature on carcass characteristics of pigs fed on wet and boiled diet.

Table 2: Carcass characteristics of crossbred Hampshire pigs of experimental groups

Parameters	Control	T_1	T_2	p-Value
Pre-slaughter weight (Kg)	69.50±1.24	70.53±0.47	72.50±0.99	0.11 NS
Hot Carcass Weight (Kg)	48.00±0.75	48.83±0.70	50.86±1.13	0.06 NS
Dressing %	69.08±0.40	69.23±0.57	70.12±0.68	0.39 NS
Carcass length (cm)	84.58±0.55	84.50±0.92	86.16±0.79	0.25 NS
Loin eye area (cm^2)	24.00±0.36	23.83±0.30	24.67±0.33	0.21 NS
Back fat thickness (cm)	1.65±0.03	1.62±0.02	1.59±0.02	0.23 NS
Ham (kg)	13.09±0.23	13.40±0.41	14.18±0.22	0.06 NS
Bacon (kg)	8.51±0.16	8.64±0.23	9.15±0.14	0.07 NS
Loin (kg)	11.07±0.22	11.08±0.33	11.78±0.23	0.13 NS
Boston Butt (kg)	6.16±0.07	6.24±0.14	6.49±0.04	0.06 NS
Picnic (kg)	6.24±0.12	6.30±0.16	6.69±0.15	0.09 NS
Jowl (kg)	1.63±0.04	1.68±0.03	1.75±0.02	0.06 NS
Heart (kg)	0.27±0.01	0.27±0.01	0.30±0.01	0.28 NS
Liver (kg)	1.37±0.04	1.33±0.02	1.42±0.04	0.16 NS
Kidney (kg)	0.23±0.01	0.22±0.01	0.21±0.01	0.34 NS
Head (kg)	3.90±0.27	4.00±0.28	4.12±0.30	0.87 NS
Lungs (kg)	0.72±0.01	0.74±0.01	0.75±0.01	0.25 NS
GIT (kg)	11.22±0.39	10.92±0.30	11.27±0.25	0.72 NS
Tail (kg)	0.14±0.00	0.12±0.01	0.12±0.00	0.14 NS
Shank (kg)	1.60±0.01	1.61±0.02	1.63±0.01	0.29 NS
Weight of expelled blood (kg)	3.06±0.21	3.12±0.14	3.12±0.03	0.95 NS

NS = Non-significant

The results of the present investigation correspond with the findings as reported by Rahman *et al.* (2015) [17] who found that crossbred Hampshire reared on deep litter system and fed on fermented diet had higher percentage of loin, ham, shoulder, jowl and lean cuts than those reared indoors. Zhou *et al.* (2011) [20] reported that pigs kept in fermented deep litter had increased (6.98 per cent) ham weight when compared to pigs kept in cement concrete floor and the difference was found to be significant (P<0.05). The findings of the present study show close conformity with the findings of Borah (2013) [5]. The similar trend also observed in the present investigation which might be due to better assimilation of boiled diet compared to wet and dry conventional diet. The results of the present investigation on edible offal of pigs are in close proximity with the findings of Borah (2013) [5] who reported that crossbred pigs reared on deep litter and conventional system had weight of liver (1.56±0.05 vs. 1.14±0.05 kg), weight of heart (0.27±0.01 vs. 0.24±0.02 kg), and weight of kidney (0.22±0.01 vs. 0.24±0.02 kg), respectively, Rahman *et al.* (2015) [17] reported that pigs fed on fermented and conventional concentrate diet had significant effect (p<0.05) on whole sale cuts of crossbred Hampshire pigs. The results from this study are comparable with that of the present study although it showed non-significant difference among the treatment groups. Zhou *et al.* (2011) [20] reported that pigs kept in fermented deep litter had increased (6.98 per cent) ham weight when compared to pigs kept in cement concrete floor and the difference was found to be significant (p<0.05). Aguilera-Soto *et al.* (2008) [2] reported that feeding different levels of wet brewer's grain had not influenced the Lung and head weight. The variation of findings with various workers might be the due to variation in form of diet and rate of assimilation of different diet forms, breed of experiment and management practices.

Summary and Conclusion

From the present study, it maybe it may be summarised that the slaughter, hot carcass weight and dressing percentage of T_2 (pigs fed with boiled diet) group was higher over control and T_1 (pigs fed with wet diet) group. Likewise, wholesale cuts, edible offal and inedible offal, physico-chemical and organoleptic properties found to higher in T_2 group than control and T_1 group.

Thus, it may be concluded that feeding of boiled feed may be suggested for improved carcass and pork quality characteristics and better cost of production. From the different forms of feeding in pig, the present study may conclude that boiled feed may be alternative choice of feeding to pigs. However, this requires further comprehensive study on larger group of animals.

Acknowledgement

The author expresses sincere gratitude to the Hon'ble Vice Chancellor of Assam Agricultural University, Jorhat and the Dean, College of Veterinary Science, AAU, Khanapara, Guwahati-22, for their cooperation, assistance throughout the research work. Heartfelt thanks are also extended to the staff of Ruhini Deka Farm Complex, Morigaon, for their kind teamwork, assistance, and timely help during the execution of the study. Their support played a vital role in the successful completion of this work.

References

1. 20th livestock census. Department of animal husbandry and dairying. Government of India; c2019.
2. Aguilera-Soto JI, Ramirez RG, Arechiga CF, Gutiérrez-Bañuelos H, Mendez-Llorente F, Lopez-Carlos MA, et al. Effect of fermentable liquid diets based on wet brewers grains on performance of growing pigs. J Appl Anim Res. 2008;36(2):271-274.
3. Alonso R, Aguirre A, Marzo F. Effects of extrusion and traditional processing methods on antinutrients and in vitro digestibility of protein and starch in faba and kidney beans. Food Chem. 2000;68(2):159-165.
4. Aumaitre A. Évaluation de divers traitements technologiques des céréales. IV. Influence du floconnage et de l'expansion de l'orge et du mais sur les performances du porcelets sevré à 21 jours: Effets sur la digestibilité des éléments de la ration. Ann Zootech. 1976;25:41-51.
5. Borah P. Wean-Finish performance and carcass characteristics of crossbred Hampshire pigs reared in conventional and deep litter housing [M.V.Sc. Thesis]. Jorhat: Assam Agricultural University; c2013.
6. Chae BJ. Impacts of wet feeding of diets on growth and carcass traits in pigs. J Appl Anim Res. 2000;17:81-96.
7. Dellavalle G, Guillien L, Gueguen J. Relationships between processing conditions and starch and protein modifications during extrusion-cooking of pea flour. J Sci Food Agric. 1994;64:509-517.
8. Hurst D, Clarke L, Lean IJ. Effect of liquid feeding at different water-to-feed ratios on the growth performance of growing-finishing pigs. Animal. 2008;2(9):1297-1302.
9. Ikurior SA, Torhee SA, Anthony TI. Effects of cooked or roasted full, fat soya bean and soya bean meal on performance and carcass characteristics of growing-

finishing pigs. J Sci Food Agric. 1992;61(3):309-314.
10. Kim JH, Heo KN, Odle J, Han IK, Harrell RJ. Liquid diets accelerate the growth of early-weaned pigs and the effects are maintained to market weight. J Anim Sci. 2001;79(2):427-434.
11. Liptrap DO, Hogberg MG. Physical forms of feed: feed processing and feeder design and operation. In: Millet ER, Ullcey DE, Lewis AJ, editors. Swiite nutrition. Butterworth-Heinemann; c1992. p. 373.
12. Medel P, Baucells F, Gracia MI, de Blas C, Mateos GG. Processing of barley and enzyme supplementation in diets for young pigs. Anim Feed Sci Technol. 2002;95:113-122.
13. Moon JS, Kwon IK, Chae BJ. Effects of wet feeding of diets with or without food waste on growth performance and carcass characteristics in finishing pigs. Asian Australas J Anim Sci. 2004;17(4):504-510.
14. Ngapo TM, Dransfield E, Martin JF, Magnusson M, Bredahl L, Nute GR. Consumer perceptions: Pork and pig production. Insights from France, England, Sweden, and Denmark. Meat Sci. 2003;66:125-134.
15. Njoku CP, Adeyemi OA, Sogunle OM, Aina ABJ. Growth performance, carcass yield and organ weight of growing pigs fed different levels of feed. Slovak J Anim Sci. 2015;48(1):16-22.
16. O'Meara FM, Gardiner GE, O'Doherty JV, Lawlor PG. The effect of feed form and delivery method on feed microbiology and growth performance in grow-finisher pigs. J Anim Sci. 2020;98(3):21.
17. Rahman M, Bora JR, Sarma AK, Roychoudhury R, Borgohain A. Effect of deep litter housing and fermented feed on carcass characteristics and meat quality of crossbred Hampshire pigs. Vet World. 2015;8(7):881.
18. Thomas R, Banik S, Barman K, Mohan NH, Sarma DK. Carcass composition and meat quality parameters of Ghungroo pigs. Indian J Anim Sci. 2016;86(8):925-929.
19. Vázquez NA, Barragán HB, Aguilar NCV, Brenner EG, Dávila FS, Trejo AM, et al. Effect of wet feeding of finishing pigs on production performance, carcass composition and meat quality. Rev Mex Cienc Pecu. 2021;12(2):370-385.
20. Zhou YG, Wen AY, Ning KJN, Xu BN, Xie JL, Tang H, et al. Effects of biological fermentation bed on growth performance and pork quality of growing-finishing pigs. J Anhui Sci Tech. 2011.