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SHORT COMMUNICATION

Contribution of Carcass Cuts in Meat Production of Kadaknath, Aseel and Vanraja Breeds of Chicken

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ABSTRACT

A comparative study was conducted to find out the differences in contribution of carcass cuts in meat production from indigenous breeds such as Vanraja, Aseel and Kadaknath breeds with respect to a broiler strain, Cobb-400. The primal cuts of Cobb-400 had significantly ($P<0.05$) higher weight than all indigenous breeds. Among indigenous breeds Aseel exhibited higher weight of all primal cuts except neck while lowest values were recorded in Kadaknath with the exception of wing and breast. The highest weight cut was breast in Cobb-400 and Kadaknath while in Vanraja and Aseel, the maximum values were observed for leg. Neck was recorded as lowest weight cut in all chicken breeds.

Keywords: Cobb-400, Vanraja, Aseel, Kadaknath, carcass cuts, meat

Cross breed broiler strains are having major contribution in chicken meat. However, a group of Indian consumers have acquired a preference for the taste of meat from native chicken. Though the market of meat for native chicken is still confined but growing rapidly in some of the areas of our country. That is because of the consumption of meat of these native breeds is solely dependent on the choice of food habits of the consumers residing in varying regions of the country and they have different mythology (Singh and Pathak, 2016; Kandir and Yardimci, 2015). Kadaknath is a native chicken breed of Madhya Pradesh, popularly known as '*Kali Masi*' in that region because it gives black flesh. It is well known breed of chicken for adaptability and well tasting black meat. It is also believed that meat of this breed is able to infuse vigour, black colour of Kadaknath is assumed to be mainly due to accumulation of melatonin. Meat of this breed also contains hormones, amino acids and is used for treating women diseases viz. sterility, menoxenic, habitual abortion, blood leucorrhoea, metrorrhagia and sickness after giving birth to offspring and also helps in curing T.B., heart diseases, neuraesthenia, children's osteomalacia etc. Aseel is well known breed for pugnacity, high stamina, majestic gait and dogged fighting qualities. It is rare and encountered in parts of Andhra Pradesh, Uttar Pradesh and Rajasthan. The most popular Aseel varieties are peela (golden red), yarkin (black and red), Nurie (white), kagar (black), chitta (black and white silver), Teekar (brown) and Reza (light red). It is poor in productivity but the breed is well-known for its meat qualities (www.vuatkerala.org). Chatterjee *et al.* (2007) conducted research on body conformation of Aseel and Kadaknath breed of chicken and found 7.75 cm, 6.89 cm and 70.45 degrees and 9.52 cm, 8.40 cm and 81.65 degrees shank length, keel length and breast angle of Kadaknath and Aseel, respectively. They also stated that shank length, keel length and breast angle were all significantly ($P<0.05$) higher in Aseel than Kadaknath. A comparative study on production performance of Aseel and Kadaknath was done by Haunshi *et al.* (2011) in which Aseel breed showed ($P < 0.001$) higher body weight at different ages; higher shank, radius, and toe lengths at 40 wk of age than did the Kadaknath breed. Vanaraja is a dual purpose, multi-coloured bird for family poultry production evolved at the Project Directorate on Poultry, Hyderabad. It is best suited

chicken breed of Manipur state (Rama Rao *et al.,* 2012; Verma *et al*., 2015; Singh *et al.,* 2016).

The meat traits based on body weight, growth rate and feed efficiency under intensive as well as backyard farming is available in literature. However, the information relating to contribution of different carcass cuts in meat production in theses breeds is almost negligible. The knowledge of carcass cuts and its contribution in meat traits of these breeds may be helpful in formulation of breeding plans for further improvement and economics considerations. So a study was planned to evaluate the contribution of carcass cuts in total meat production in indigenous chicken in respect to a broiler strain, cobb-400.

Chicks were reared on deep litter system for six weeks before sacrificing. The birds were kept off feed for 12 hours before the actual slaughter, however, *ad-libitum* drinking water was provided during starvation. The birds were slaughtered after weighing as per Halal procedure followed by manual dressing. Scalding was not performed as skin along with feathers was removed from carcass. The hot weight was recorded immediately after dressing. The dressed carcasses were kept in chiller at 4±2°C for 24 h. The cold carcass weight was recorded after 24 hours followed by fabrication of standard primal cuts. The weight of individual cuts were also recorded and computed with respect to their live weight, and cold carcass weight. The data obtained was subjected to statistical analysis as per method prescribed by Snedecor and Cochran (1994) using SPSS statistics 16 software.

The mean weight values of different chicken breeds for carcass cut up parts viz breast, back, thigh and leg, wing and neck in male, female and pooled sex group are presented in Table 1 to 3. The anova of variance indicated that mean value of breast weight of Cobb-400 was significantly (P<0.05) higher than the values recorded for other breeds irrespective of sex. Among the indigenous breeds, the mean breast weight recorded for male birds of Aseel was significantly (P<0.05) higher than mean breast weight recorded for Vanraja and Kadaknath, however, the values of later two were found to be comparable. Similar trend was observed in females and pooled sex group

Cobb-400 and Kadaknath carcass were showing relatively higher proportion of breast than other cuts which might be attributed to genetic characteristics of the said breeds (Islam *et al.,* 2002 and Paul *et al.,* 1990). The percent breast weight values were higher in present investigation than as reported by Mahapatra *et al.* (1982) in Aseel Kagar and Aseel Peela, Sharma (1995) in Mizoram chicken, Vijh *et al.* (2005) in miri and Tantia *et al.* (2006) in Ankaleshwar birds. The higher breast weight in males than females is in agreement with reports of Hossain *et al.* (2012) on full feathered chicken.

The anova of variance indicated that mean value of back weight of Cobb-400 was significantly (P<0.05) higher than the values recorded for other breeds irrespective of sex. Among the indigenous breeds, the mean back weight recorded for male birds of Aseel was significantly (P<0.05) higher than mean back weight recorded for Vanraja and Kadaknath, however, the values of later two were found to be comparable. Similar trend was observed in females and pooled sex group.

The back values reported in the study were lower than the back values reported by Mahapatra *et al.* (1982) in Aseel Kagar and Aseel Peela, Sharma (1995) in Mizoram chicken, Vijh *et al.* (2005) in miri and Tantia *et al.* (2006) in Ankaleshwar birds indicating lesser proportion of back in studied native chicken. Cobb-400 had higher back weight than all indigenous chicken breeds which could be due to its fast growing tendency or genetic characteristics. The back weight of indigenous breeds was higher in males than females which are in agreement with the findings of Pathak *et al.* (2009) and Debata *et al.* (2012) for adult Vanraja while the reverse trend was observed in Cobb-400. The work reported by Debata *et al.* (2012) in Black rock and Red Cornish support the findings of the study.

The anova of variance indicated that mean value of leg weight of Cobb-400 was significantly (P<0.05) higher than the values recorded for other breeds irrespective of sex. Among the indigenous breeds, the mean leg weight recorded for male birds of Aseel was significantly (P<0.05) higher than mean leg weight recorded for Vanraja and Kadaknath, however, the values of later two were found to be comparable. Similar trend was observed in females and pooled sex group.

The leg weight values reported in the study were higher than the values reported by Mahapatra *et al.* (1982), Sharma (1995), Jaturasith *et al.* (2002), Vijh *et al.* (2005) and Tantia *et al.* (2006) in indigenous chicken. The leg weight in Cobb-400 was significantly (P<0.05) higher than all indigenous breeds. Males had higher leg weight

than females in both Cobb-400 and indigenous breeds Debata *et al.* (2012) observed same trend while comparing the growth rate of commercial breeds like Black rock and Red Cornish with Vanraja.

The anova of variance indicated that mean values of wing weight in Cobb-400 males were found significantly ($P<0.05$) higher than all the indigenous chicken breeds while no significant difference was observed in average wing weight among indigenous breeds. The similar trend was observed in females and pooled sex group.

The wing weight values reported in the study showed similar values as reported by Mahapatra *et al.* (1982) in Aseel Kagar and Aseel Peela, Sharma (1995) in Mizoram chicken, Jaturasith *et al.* (2002) in Thai native chicken, Vijh *et al.* (2005) in Miri. The higher wing weight values in Cobb-400 and Aseel indicated better muscle growth in these breeds. Males had higher wing weight than females in all the studied breeds. Similar results were obtained in the study conducted by Debata *et al.* (2012) on Black rock, Red Cornish and Vanraja. Pathak *et al.* (2009) also observed same trend in their study on Vanraja.

The anova of variance indicated that mean values of neck weight in Cobb-400 males were found significantly ($P<0.05$) higher than all the indigenous chicken breeds while no significant difference was observed in average neck weight among indigenous breeds. The similar trend was observed in females and pooled sex group.

The neck weight values reported in the study showed lower values as reported by Mahapatra *et al.* (1982), Sharma (1995), Vijh *et al.* (2005) and Tantia *et al.* (2006). The neck weight in Cobb-400 was highest among all studies breeds while Vanraja had higher neck weight value among indigenous breeds. The higher neck weight in Vanraja compared to Black rock was reported by Debata *et al.* (2012). The neck weight in females was higher than males in all chicken breeds except Vanraja and the finding was in agreement of the reports published by Hossain *et al.* (2012) for commercial broilers.

Table 1: Carcass cut up part weight values (g) in various groups of different chicken breeds

(Mean±SE)

Carcass cuts		Chicken breeds/strain			
		Cobb-400	**Vanraja**	**Aseel**	**Kadaknath**
Breast	Male	166.89^{a}±5.94	64.71^{c}±2.81M	83.36^{b}±1.88	65.93^{c}±1.33
	Female	157.36^{a}±5.74	62.44^{c}±2.83	81.61^{b}±1.90	66.04^{c}±1.32
	Pooled sex	162.13^{a}±4.19	63.58^{c}±1.93	82.49^{b}±1.30	65.99^{c}±0.89
Back	Male	83.87^{a}±4.27	45.30^{c}±3.04	57.75^{b}±2.94	37.65^{c}±0.73
	Female	89.35^{a}±3.93	43.03^{c}±3.07	55.35^{b}±2.96	36.76^{c}±0.75
	Pooled sex	86.61^{a}±2.89	44.16^{c}±2.09	56.55^{b}±2.02	37.21^{c}±0.51
Leg	Male	162.21^{a}±5.74	69.95^{c}±3.09	86.27^{b}±2.33	65.33^{c}±1.16
	Female	156.92^{a}±5.49	65.67^{c}±3.14	84.19^{b}±2.34	63.44^{c}±1.20
	Pooled sex	159.56^{a}±3.87	67.81^{c}±2.19	85.23^{b}±1.60	64.39^{c}±0.84
Wing	Male	64.84^{a}±5.11	30.29^{b}±1.85	34.69^{b}±1.34	29.54^{b}±0.82
	Female	63.35^{a}±4.77	27.72^{b}±1.16	33.79^{b}±1.32	28.65^{b}±0.82
	Pooled sex	64.09^{a}±3.34	29.01^{b}±1.11	34.24^{b}±0.91	29.09^{b}±0.57
Neck	Male	38.20^{a}±3.20	24.63^{b}±2.70	17.48^{b}±0.97	18.74^{b}±1.27
	Female	39.03^{a}±2.65	22.68^{b}±2.61	21.94^{b}±1.17	19.65^{b}±1.27
	Pooled sex	38.62^{a}±1.91	23.65^{b}±1.81	19.70^{b}±0.99	19.18^{b}±0.86
Total	Male	516.01^{a}±11.46	234.88^{c}±6.11	279.55^{b}±12.85	217.19^{c}±4.09
	Female	506.01^{a}±11.50	221.54^{c}±6.44	276.88^{b}±11.60	214.54^{c}±4.11
	Pooled sex	511.01^{a}±7.88	228.21^{c}±4.68	278.21^{b}±8.26	215.86^{c}±2.79

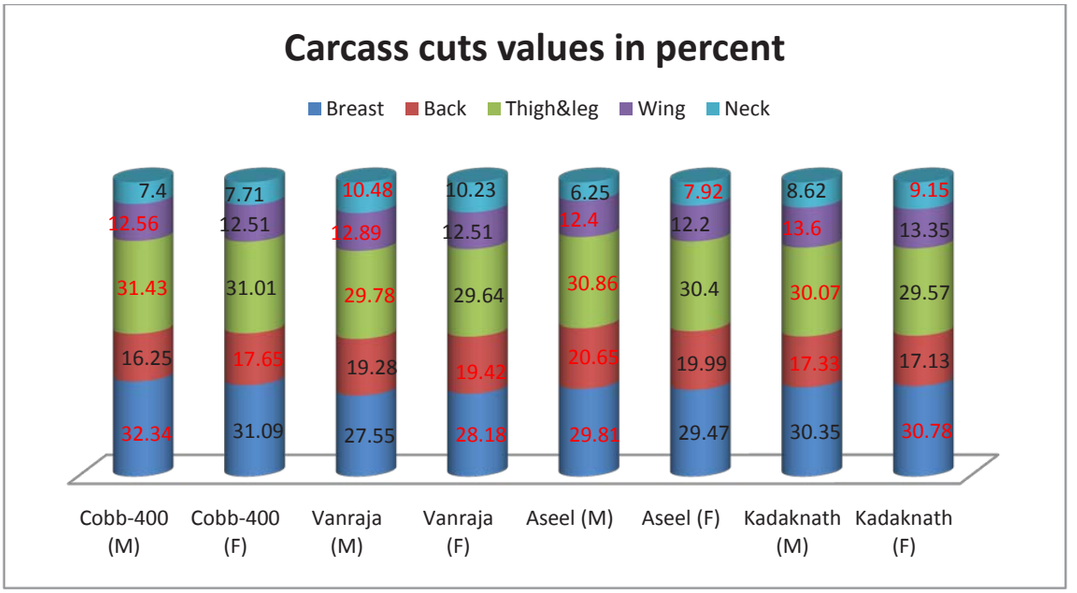

Fig. 1: Percent carcass cuts of various breeds/strain

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REFERENCES

Chatterjee, R.N., Sharma, R.P., Reddy, M.R., Niranjan, M. and Reddy, B.L.N. 2007. Growth, body conformation and immuneresponsiveness in two Indian native chicken breeds. *Liv. Res. Rural Dev.*, **19 (10)**: 209-222.

Debata, D., Panigrahi, B., Panda, N., Pradhan, C.R., Kanungo, S. and Pati P.K. 2012. Growth performance and carcass traits of Black Rock, Red Cornish and Vanaraja chicken reared in the coastal climatic condition of Odisha. *Indian J. Poult. Sci.,* **47(2)**: 214-217.

Haunshi, S., Niranjan, M., Shanmugam, M., Padhi, M.K., Reddy, M.R., Sunitha, R., Rajkumar, U. and Panda, A.K. 2011. Characterization of two Indian native chicken breeds for production, egg and semen quality, and welfare traits. *Poult. Sci.,* **90(2)**:314-320.

Hossain, M.M., Nishibori, M. and Islam, M.A. 2012. Meat Yield from Broiler, Indigenous Naked Neck and Full Feathered Chicken of Bangladesh. *The Agricult.,* **10(2)**: 55-67.

Islam, M.A., Seeland, G., Bulbul, S.M. and Howlider, M.A. R. 2002. Meat yield and cooked meat taste of hybrids from different genetic groups in a hot-humid climate. *Indian J. Anim. Res.*, **36**: 35-38.

Jaturasitha, S., Leangwunta,V., Leotaragul, A., Phongphaew, A., Apichartsrungkoon, T., Simasathitkul, N., Vearaslip, T., Worachai, L. and Meulen, U. 2002. A comparative study of Thai native chicken and broilers on productive performance, carcass and meat quality. *Conference on International Agricultural Research for Development*, Deutscher, Tropentag, Witzenhausen, pp. 897-906.

Kandir, E.H. and Yardimci, M. 2015. Effects of kefir on growth performance and carcass characteristics in Pekin Ducks (*Anasplatyrhynchos domestica*). *J. Anim. Res*., **5**(2): 207-2012.

Mahapatra, C.M., Pandey, N.K. and Rao, G.V. 1982. Effect of diet, strain and sex on the carcass yield and meat quality of broilers. *Indian J. Poult. Sci.*, **17**: 276-280.

Paul, B.P., Howlider, M.A.R. and Bulbul, S.M. 1990. Comparison of meat yield between free range *desi* and broiler chicken. *Indian J. Anim. Sci.*, **60**: 866- 868.

Pathak, V., Bhat, Z.F., Bukhari, S.A.A. and Ahmad, S.R. 2009. Carcass quality parameters of Vanaraja chicken. *Indian J. Poult. Sci.,* **44(1)**: 97-99.

Rama Rao, S.V., Praharaj, N.K., Reddy, M.R., Shyam Sunder, G. and Ayyagari V. 2012. Vanaraja - A Prospective Dual Purpose Bird for Rural and Tribal Areas. Poulvet.com

Sharma, D. 1995. Performance of Native fowl of Mizoram under intensive system. *Indian J. Poult. Sci.*, **30**(1): 31-35.

Singh, B.P., Kandeepan, G. and Vishnuraj, R. 2016. Physicochemical quality assessment of vacuum packed frozen chicken sausages subjected to temperature fluctuations during storage. *J. Anim. Res*., **6**(5): 967-972.

Singh, V.P. and Pathak, V. 2016. Comparative assessment of carcass traits in indigenous chicken. *J. Anim. Res*., **6**(1): 921-926.

Snedecor, G.W. and Cochran W.G. 1994. Statistical Methods. 8th ed. Affiliated East-West Press, New Delhi, India, and Iowa State University Press, Ames.

Tantia, M.S., Khanna, K., Vij, R.K., Singh, G. and Ahlawat, S.P.S. 2006. Chicken Breeds of India-Ankleshwar. *Leaflet 37, National Bureau of Animal Genetics Resources*, P.O. Box 129, Karnal, 132001.

Verma, A.K., Chatli, M.K., Mehta, N. and Kumar, P. 2015. Process protocol and cost of production of functional fiber enriched pork loaves. *J. Anim. Res*., **5**(1): 135-142.

Vijh, R.K., Roy, T.C., Vij, P.K., Tantia, M.S. and Ahlawat, S.P.S. 2005. Chicken breeds of India Miri. *Leaflet 2, National Bureau of Animal Genetics Resources*, P.O. Box 129, Karnal, 132001.