Non-carcass characteristics of intensive fattening of Kacang goat with different sex

M Hatta, S Baco and Hastang
Faculty of Animal Science, Universitas Hasanuddin, Makassar

E-mail: dira_hatta@yahoo.com

Abstract. This study was aimed to examine the characteristics of non-carcasses with economic and non-economic value in male and female goats that are fattened intensively. The study was conducted at the Laboratory of Livestock Production and Laboratory of Feed Biochemistry, Hasanuddin University Makassar. This study used 16 yearling Kacang goats, consist of eight males and eight females. During the intensive fattening stage, the animals were fed 3% of mix ration based on the dry matter and body weight for three months. The second stage was slaughtering and dressing carcasses. This stage the goats are weighed before slaughtered, after that, the carcass is carried out and weighed all the non-carcass parts. Data were analyzed using the T-test and descriptive. Data processing using SPSS version 16 computer program package.

The results of research on Kacang goats showed that the percentage of the total non-carcass weight of male goats was relatively the same compared to female Kacang goats. Males non-carcass weights have economic value relatively higher than female goats.

1. Introduction
Kacang goat is native livestock from Indonesia which has good trade and relatively small bones. This goat has several advantages, among others, not being selective in food or being able to utilize low quality feed, because of its high adaptability and even able to produce well in degraded lands with a daily weight gain of 50-150 g/h/d. Goats contribute greatly to the supply of meat and occupy the second position of non-poultry after cattle. Intensive maintenance has been carried out by [1] by using fresh forage. The obstacle faced is the provision of limited and unsustainable forage. Also, forage dry material is also very volatile so that livestock lack dry material even though they consume a lot of forage. The carcass produced was low (37.50%) and non-carcass was high (62.5%).

Improved management through intensive maintenance patterns with dry feed is expected to increase the proportion of carcasses and reduce the proportion of non-carcasses. Indicators of the high percentage of carcasses can be seen from the percentage of non-carcasses, especially non-carcasses that cannot be consumed or lack economic value. Therefore, it is necessary to research the non-carcass characteristics of the male and female Kacang goats which are fattened intensively. The purpose of this study is to examine the non-carcass characteristics which are of economic and non-economic value in intensively fattened male and female goats.
2. Research methods

2.1. Place of research
The study was conducted at the Laboratory of Livestock Production and Laboratory of Feed Biochemistry, Universitas Hasanuddin, Makassar

2.2. Research materials
Research used 16 yearling Kacang goats consist of eight males and eight females. Animal feed (concentrate material) used local materials from the agroindustry waste, i.e. rice bran, corn, coconut meal, molasses, mineral mix, urea, salt, and fish meal. Forage materials used were *Linnea coromandel*, *Gliricidia maculata* and *Leucena leucocephala*.

The instrument used is an electronic digital scale for goats which has a capacity of 500 kg, used to measure livestock weights, and knives for carcasses trimming and cutting.

2.3. Research procedure

2.3.1. Maintenance management. Phase I research carried out acclimatized habituation for three weeks to provide opportunities for livestock to adapt to the environment and feed provided. During habituation, animals were given both oral and injection drugs such as ivermectin for deworming, B-complex vitamins, antibiotic, and other drugs. Concentrate feed given as much as 3% of body weight, while forage dry given ad-libitum.

| Material     | Composition (%) |
|--------------|-----------------|
| Rice bran    | 35.50           |
| Corn         | 36              |
| Coconut cake | 15              |
| Molasses     | 1               |
| Mineral      | 1               |
| Urea         | 2.50            |
| Salt         | 1               |
| Probiotics   | 1               |
| Fish meal    | 7               |

The composition of the concentrate feed was presented in table 2. Concentrated feed ingredients based on local ingredients, cheap and easily obtained all the time. Concentrate feed is given in the morning and given twice a day. Forage is given ad-libitum after the concentrate is used up. In addition to feeding, livestock health is always controlled through good sanitation, provision of medicines and vaccinations. Livestock raising in general still applies Good Management Practice (GMP).

2.3.2. Cutting procedure. Cutting procedure starts from with fasting before slaughter for 8 hours, but the water still is given ad libitum. The purpose of mastering livestock before slaughtering is to minimize the variation in cut weight due to digestive tract contents and to facilitate the implementation of slaughter. Slaughtering of animals is carried out in a halal manner starting with cutting the neck until the jugular veins, esophagus, and trachea are cut off for complete blood loss. Then the end of the esophagus is bound so that the rumen fluid does not come out if the animal is hung. Furthermore, the barking and carcasses by way of head released from the body in the joints occipito-Atlantis. The forelegs and hind limbs are released at the carpometacarpal joint and tarsometatarsal joint. Furthermore, the animal is hung on tendon-achilles on both hind legs, then the skin and viscera are removed, including the liver, spleen, heart, lungs and rumen, and intestine. All these parts are weighed individually determines the weight of each piece.
2.4. Research parameters
Parameters measured were total non-carcass, non-carcass with economic and non-economic value. For more details, see tables 2 and 3.

2.5. Data analysis
The data obtained were analyzed using the t-test [2]. Data processing using the computer program SPSS Version 16 for Windows.

3. Results and discussion
The productivity of fattening and slaughtering goat was measured based on weight gain, carcasses, and meat production as well as the resulting sequel. The results of slaughtering were divided into two major parts, i.e. carcass and non-carcass. Further, non-carcass parts were classified as high and less economic value. Increasing non-carcass means decreasing the percentage of the carcass. Vice versa, an increase in the percentage of carcasses will reduce the percentage of non-carcasses. The lower present a non-carcass of the animal the better productivity.

Table 2. Non carcass percentage of Kacang goat with different sex.

| Variables          | Male     | Female   |
|--------------------|----------|----------|
| Blood              | 0.34 ± 0.79 | 3.69 ± 1.07 |
| Respiratory        | 1.36 ± 0.39 | 1.28 ± 0.25 |
| Digestion          | 30.21 ± 3.45 | 32.29 ± 3.03 |
| Feet               | 3.62 ± 0.46 | 3.28 ± 0.54 |
| Reproductive organs| 1.17 ± 0.16 | 0.96 ± 0.20 |
| Total              | 39.81    | 41.50    |

Based on table 2 known that the results of research on Kacang goat reared intensively uses feed high protein, has the characteristics of a percentage of non-carcass of the blood, head, skin, feet, and the organs of reproduction in males and and females respectively as follows: 3.45 and 3.69; 8.53 and 8.12; 7.74 and 7.43; 3.62 and 3.28; 1.17 and 0.96. These results indicate that sex does not significantly affect the percentage of non-carcass parts of goat nuts, especially blood, head, skin, legs, and reproductive organs.

This may be due to the shape of the body Kacang goat both males and females have a posture that is equal to the weight cut and the same relative age. It is appropriate as reported by [3] that the percentage of non-carcass weight Kacang goat male section head 8.03%, leather 7.37%, feet 3.19. Whereas for female Kacang goat, the percentage of head weight is 7.10%, the skin 7.83%, and feet 2.22%. The percentage of non-carcasses with less economic value in this study was 39.81 for males and 41.5 for females. This value is not significantly different but females are higher than males. [3] reported that the percentage of non-carcasses that lacked male economic value was 18.76 and females 17.20%. This difference occurs because it does not include the blood and digestive tract. However, both show that there is no real difference between males and females. Percentage in the direction of following the animal's body posture, the heavier the cattle the heavier the blood as well as the reproductive organs, head, skin, lower legs.

Table 2 show that the percentage of non-carcass weight which is less economical is higher in females compared to males. The non-carcass parts in question are respiratory, blood, foot, reproductive and digestive organs. According to [4] the percentage of head 10.24%, skin 8.80%, feet 3.16%, blood 5.14%, respiratory apparatus 1.26%, and digestive apparatus 15.1%. As for the total non-carcass whose economic value is 42.44%. This shows that the percentage is relatively the same as the results of this study which is 39.81% for males and 41.5%.
Table 3. Non-carcass percentage of Kacang goat.

| Variables | Male     | Female    |
|-----------|----------|-----------|
| Kidney    | 0.35 ± 0.01 | 0.37 ± 0.05 |
| Liver     | 1.90 ± 0.49 | 1.82 ± 0.20 |
| Spleen    | 0.13 ± 0.05 | 0.17 ± 0.04 |
| Heart     | 0.65 ± 0.44 | 0.73 ± 0.13 |
| Head      | 8.53 ± 0.39 | 8.12 ± 0.63 |
| Skin      | 7.74 ± 0.89 | 7.43 ± 0.44 |
| Total     | 59.11     | 60.14     |

Table 3 to show that the percentage weight of the kidneys, liver, spleen, heart, head and skin of Kacang goat males and females respectively as follows: 0.35 and 0.37; 1.90 and 1.82; 0.13 and 0.17; 0.65 and 0.73; 8.53 and 8.12; and 7.74 and 7.43. These data indicate that the male and female Kacang goats intensively reared by feeding high-protein are statistically kind of sex do not give a significant effect on the percentage by weight of kidney, liver, spleen, heart, and skin. [4] reported that the percentage of the weight of kidney, liver, lymph, heart, head, and skin of Kacang goat were 0.40, 2.11, 0.18, 0.48, 10.24, and 8.80, respectively. This value is higher if in appeal with the results of this study. This difference may be caused by research Ridha [4] calculated based on the empty weight, which means that the influence of the digestive tract removed. According to [5] states that sex affects the weight of the head and fat of the digestive tract. Male cattle have heavier heads but less digestive tract fat compared to female cattle. Another factor that causes differences in head organ weight between male and female goats is that male sex is faster than female goats.

The total percentage of non-carcass males and females respectively 59.11 and 60.14 were not significantly different between females and males. [6] reported that the non-carcass percentage of Kacang goats was 61.21, while [1] reported that the percentage of non-carcasses of Kacang goat was 62.5, [7] 50-60% and [8] the average percentage of non-carcasses of goat nuts was 53.73%. The difference in the results of various studies is due to several factors including the nation's weight cut and genetic. Furthermore, it was reported that Kacang goats with cutting weights of 18.5, 20.03 and 21.33 resulted in non-carcass percentages 54.24, 53.73 and 53.23, respectively. [9] state that the percentage of non-carcass weight and Kacang goat 8,740 g and the percentage of non-carcass Kacang goat 58.28%. Whereas [10] reported that the Kacang goat had a non-carcass percentage of 56.17%, [11] states that carcass weight is influenced by age, nation, food, and condition of the animal itself. Whereas [12] states that, a livestock nation that has a large slaughter weight will produce a large carcass weight also this means that the higher the slaughter weight the lower the percentage of non-carcasses.

This may also be caused because the weight of male and female cattle are also not significantly different. So that the animal parts are also relatively the same. As with body dimensions, the non-carcass and offal weights were not significantly different. According to [13] the performance of livestock is the result of the influence of hereditary factors and cumulative influences on environmental factors experienced by the livestock concerned. Furthermore, it is stated that the genetic factors of livestock determine the ability possessed by livestock while environmental factors provide opportunities for livestock to display his abilities. Then it was also emphasized that livestock will not show a good performance if it is not supported by a good environment where the livestock lives or are maintained, otherwise a good environment does not guarantee good performance if the livestock does not have good genetic quality.

The research cattle used have indeed been through the selection and during the study were given the same treatment as quality feeding. This causes the research cattle both male and female to grow normally according to their potential. So it does not show a real difference between the two, both growth and conformation of body parts.
4. Conclusions

Results of research on Kacang goat showed that the percentage of the total weight of the non-carcass goats are relatively much lower compared with the female Kacang goat. The percentage of non-carcasses that have high economic value is higher in male cattle compared to females.

References

[1] Sumardianto T A P, Purbowati E and Masykuri 2013 Karakteristik karkas kambing Kacang, kambing Peranakan Etawa dan kambing Kejobong jantan pada umur satu tahun. *Anim. Agric. J.* 1 175-82

[2] Steel, R G D and Torrie J H 1999 *Principles and Procedures of Statistics* (New York: McGraw)

[3] Linda 1992 *Effect of Gender on Percentage of Some Non-Carcass/Offal Parts of Goat Nuts Intensively Maintained Faculty of Animal Science* (Makassar: Hasanuddin University)

[4] Ridha C Y 2014 *Characteristics of carcasses and non-carcasses of Kacang goat and Etawah crossbreed goats at a slaughter weight of 17 kg* Thesis (Bogor: IPB University)

[5] Gaili E S E and Mahgoub O 1981 Sex differences in body composition of Sudan desert sheep *Rev Anim. Prod.* 17 27-30

[6] Sari R T, Purnomoadi A and Adiwinarti R 2016 Commercial cuts and carcass components of peanut bucks aged 1-1.5 years old reared traditionally (case study in Wirosari district Grobogan regency) *Anim. Agric. J.* 2 11-16

[7] Devendra C and Mcleroy G B 1990 *Goat and Sheep Production in the Tropics* (Singapore: Longman Group Ltd)

[8] Hutama Y G, Lestari C M S and Purbowati E 2014 Carcass and non-carcass production of male fed goat beans with different levels of protein and energy *Anim. Agric. J.* 1 17-23

[9] Kusuma A, Purnomoadi A and Al-Baarr A N 2013 Comparison of skin percentage between Kejobong goats, Etawah Peranakan goats, and one-year-old male Kacang goats *Anim. Agric. J.* 1 114-119

[10] Sunarlim R and Setiyanto H 2005 Commercial carcass cuts of male goats and local male goats to the carcass physical composition, physical properties and nutritional value of meat *Bogor 12-13 September 2005 Proceedings of the National Seminar on Animal Husbandry and Veterinary Technology Center for Research and Development of Animal Husbandry, Agency, and Agricultural Development, Ministry of Agriculture, Bogor* pp. 666-673

[11] Dadi H, Duguma G, Shelima B, Fayera T, Tadesse M, Woldu T and Tucho T A, 2008 Non-genetic factors influencing post-growth growth and reproductive performances of Arsi-Bale goats *Livestock Res. Rural Dev* 20

[12] Soeparno 1994 *Meat Science and Technology* (Yogyakarta: Gadjah Mada University Press)

[13] Hardjosubroto W 1994 *Application of Animal Breeding in the Field* (Jakarta: PT. Gramedia Widiasarani Indonesia)