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CORRELATION BETWEEN BODY WEIGHT AND ORGAN WEIGHT IN DIGESTIVE SYSTEM OF NORTH SULAWESI LOCAL PIG

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Abstract

North Sulawesi local pigs have good potential because they have a high adaptability to the environment and low-quality feed obtained from processed food remnants of the population. The samples used in this study were local sows from North Sulawesi which were spread on traditional farms. The purpose of this study was to obtain data on body weight of livestock including the weight of organs in the digestive system (stomach, intestine and liver). Body weight data will be correlated with organ weight and intestinal length data. The results showed that the average body weight of the local pigs used in this study ranged from 16.65 ± 0.66 kg with the age of the cattle ranging from 1 year. The results of statistical analysis of the correlation test between body weight and organ weight of local pigs showed a very significant correlation value ($P < 0.01$). The correlation value shown in the study shows a very strong value in the correlation between body weight and the weight of an empty stomach and a strong correlation value is shown in the correlation between body weight and liver weight and intestine length, meaning that the weight of organs in the body in the digestive system will increase with increase in body weight. Body weight is one indicator of livestock productivity that can be estimated based on the size of the animal's body.

Keywords: *North Sulawesi local pigs, body weight, organ weight, digestive tract*

INTRODUCTION

Local pigs identified in Indonesia include Balinese pigs, Batak pigs, Toraja pigs, and local North Sulawesi pigs (Mege and Mokosuli, 2017. Local pigs are raised by small farmers with traditional farming systems as a side business carried out by the family, although the maintenance is on a small scale with ownership of 2–6 pigs per farmer. Indonesia has five species of pigs out of eight species in the world (Rothschild et al. 2011). The diversity of pig species in Indonesia is proven by the discovery of four different alleles and is the highest number of mitochondrial alleles found (Choi et al. 2014).

Local pigs are livestock that have been domesticated for a long time and have high adaptation to the local environment. Local pigs are developed with the aim of obtaining profits from the sale of seeds, weaning pigs, and beef pigs and further preserving family traditions and participating in national food procurement and fulfillment of good nutrition to produce a healthy, strong, and intelligent generation (Sihombing, 2006).

indonesian. biodivers.j.
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The pig digestive system is a digestive system with one stomach (monogastric) where the pig digestive system is very suitable for concentrate-based feed which is usually given to pigs. The organs involved in the digestive tract are relatively simple which are connected in a sequential musculo-membranous tube from the mouth to the anus. The large stomach (stomach, Ventriculus) is a muscular organ that is responsible for storing and initiating the breakdown of nutrients, and after that the digested food (digesta) enters the small intestine. The large stomach has four distinct sections (DeRouchey et al., 2009) including the esophageal, cardiac, fundus and pylorus sections. The esophageal region is located at the entrance of the stomach from the esophagus (oesophagus). This area of the stomach does not secrete digestive enzymes but it is important that this is where ulcers often form in pigs. Irritation in this area due to the fine size of feed particles, stress or other environmental factors can lead to ulcer formation in pigs. If an ulcer occurs, it can interfere with the health of the pig and decrease feed consumption.

Knowledge of the principles of nutrition (nutrition) in pigs is needed by farmers so that the pig farming business can still provide benefits for farmers. If the requirements for all nutrients at a normal state in all phases or levels of production have been met, but under certain conditions such as cold weather, nutrient density must be increased to meet daily needs. This is often done to reduce nutritional deficiencies that may occur due to differences in the quality of feed ingredients, genetics, health, environment and performance of a livestock business in an effective and efficient manner. Local pigs usually get their food from the leftovers or food waste of residents, so it is hoped that this research will produce data on body weight of local pigs and their relationship with organ weights in the food digestive system.

MATERIALS AND METHODS

The tools used include: Meters for measuring, sitting scales, hanging weights, surgical boards, surgical instruments, magnifying glass, 70% alcohol. Pigs were taken from small people's farms in North Minahasa and Minahasa Induk Regencies with body weights ranging from 15-20 kg.

The body weight of the cattle was measured using a hanging scale, the weight of the internal organs was measured using a sitting scale, and the length of the small intestine was measured using a meter. The body weight data was then correlated with the weight of the internal organs and the length of the intestine. Statistical analysis used is statistical correlation method, namely correlation analysis to determine whether or not there is a linear relationship between variables.

RESULTS AND DISCUSSION

Body weight and organ weight in local pigs from North Sulawesi

The average body weight of local pigs used in this study ranged from 16.65 ± 0.66 kg with an age of 1 year. Body weight is one indicator of livestock productivity that can be estimated based on the size of the animal's body. The body size of the animal which is measured from the outside and the weight of the internal organs will affect the body weight of the animal. In this study, it was shown that at the age of 1

indonesian. biodivers.j.
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year, the weight of the empty stomach was 257±18.89 grams, the liver weight was 339±40.46 grams, and the length of the intestine was 777.5±26.61 cm.

Table 1: Body weight and organ weight in local pigs

Parameters	Body weight (kg)	Empty stomach weight (grams)	Liver weight (grams)	Small intestine length (cm)
Average	16.65	257	339	777.5
Minimum	16.0	243	297	750
Maximum	17.4	284	391	805
Standard deviation	0.66	18.89	40.46	26.61

Digestion is a series of processes of physical and chemical changes experienced by foodstuffs while in the digestive tract. In the process of absorption of nutrients requires digestive organs. The organs in the digestive system have an important relationship or influence on body weight starting from the mouth, esophagus, stomach, intestines and anus.

According to Rianto and Purbowati (2011), the small intestine consists of three parts, namely the duodenum (the duodenum) which functions to break down the components of the stomach into smaller components so that it can be used by the body. Jejunum (empty intestine) functions to carry out digestion. Various components, especially water, carbohydrates, proteins, and vitamins, and the ileum (intestinal absorption), function for the absorption of salt, B vitamins and components that are not absorbed by the stomach. Digestive dregs containing methane gas in the large intestine will be absorbed by the water content and undergo decay as in humans. Then the dregs will lead to the rectum to be disposed of through the anus.

Digestive organs have an important role in processing feed for use in the growth process of the livestock. The size of the internal organs of livestock is related to the capacity of feed that can be consumed by local pigs. A large digestive tract will accommodate a lot of feed so that it is hoped that the nutrients that enter the body can also be absorbed more which will be used for livestock growth and development.

The relationship between body weight and organ weight of North Sulawesi local pigs

The body weight of local pigs is influenced by various factors such as the weight of the digestive organs (stomach and intestines). The results of statistical analysis of the correlation test between body weight and organ weights of local pigs can be seen in table 2 which shows a very significant correlation value ($P < 0.01$).

indonesian. biodivers.j.
Vol. 2; No. 3 : 39 - 43
ISSN : 2722-2659

Table 2: Correlation of body weight and organ weight in local pigs

Variable	Correlation Coefficient (r)
Body weight - empty stomach	0.908**
Body weight - liver weight	0.701**
Body weight - small intestine lengths	0.748**

Note: **The correlation is very significant at the 1% level (P<0.01)

The interpretation of the correlation coefficient according to Sugiyono (2007) is the value of 0.60 - 0.79 = strong and 0.80 - 1.00 = very strong. The correlation value shown in the study shows a very strong value in the correlation between body weight and the weight of an empty stomach, and a strong correlation value is shown in the correlation between body weight and liver weight and intestine length, meaning that the weight of organs in the body increases with increasing body weight. body.

Statistical results show that the digestive organs of local pigs have a close relationship with body weight, the higher the capacity of the digestive organs, the better the absorption of nutrients and the impact on increasing body weight of livestock. Thus, the capacity of the digestive organs such as the stomach and intestines as well as organs in the body such as the liver, kidneys and liver are important factors in increasing body weight of livestock.

CONCLUSION

The results of statistical analysis of the correlation test between body weight and organ weight in the digestive system of local pigs showed a very significant correlation value (P < 0.01). The correlation value shown in the study shows a very strong value in the correlation between body weight and the weight of an empty stomach and a strong correlation value is shown in the correlation between body weight and liver weight and intestine length, meaning that the weight of organs in the body in the digestive system will increase with increase in body weight. The body size of the animal which is measured from the outside and the weight of the internal organs will affect the body weight of the animal.

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REFFERENCES

DeRouchey, J., Goodband, B., Tokach, M., Dritz, S. and Nelssen, J. 2009. Digestive System of the Pig: Anatomy and Function Swine Profitability. Proc. of the Swine Profitability Conference 2009, held at Kansas State University on 3 February 2009.

Choi SK, Ji-Eun L, Young-Jun K, Mi-Sook M, Voloshina I, Myslenkov A, Oh JG, Tae-hun K, Markov N, Seryodkin I, et al. 2014. Genetic structure of wild boar (Sus scrofa) populations from East Asia based on microsatellite loci analyses. BMC Genet. 15:1-10.

indonesian. biodivers.j.
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Ditjen PKH. 2013. Rencana strategis Direktorat Jenderal Peternakan dan Kesehatan Hewan. Jakarta (Indonesia): Direktorat Jenderal Peternakan dan Kesehatan Hewan.

Hafez, E.S.E. and B. Hafez. 2000. Reproduction in Farm Animal. 7th ed. Lea and Febiger, Philadelphia.

Kojo R.E, V.V.J Panelewen, M.A.V Manese, N Santa . 2014. Efisiens penggunaan input pakan dan keuntungan pada usaha ternak babi di Kecamatan Tateran Kabupaten Minahasa Selatan. Fakultas Peternakan Universitas Sam Ratulangi Manado. Jurnal Zootek. 34(1): 62-74

Mangun, N. 2007. Analisi Potensi Ekonomi Kabupaten dan Kota di Sulawesi Tengah. Pascasarjana Universitas Diponegoro, Semarang.

Mege, R. A., Mokosuli, Y.S. 2017. DNA Barcoding of local pigs in minahasa, north Sulawesi. International Journal of Fauna and Biological Studies, pp. 4(5):82-87.

Mege R, Nasution S.H, Manalu W. 2007. Pertumbuhan dan Perkembangan Uterus dan Plasenta Babi dengan Superovulasi. Hayati Journal of Biosciences. Vol. 14, No 1.

Rothschild M. F, Ruvinsky A, Larson G, Gongora J, Cucchi T, Dobney K, Andersson L, Plastow G, Nicholas FW, Moran C, et al. 2011. The genetics of the pig. 2nd ed. Rothschild MF, Ruvinsky A, editors. London: CAB International.

Sihombing, D. T. H. 2006. Ilmu Peternakan Babi, Gajah Mada University Press (ID), Yogyakarta.

Taylor. R. E. and Field, T. G. 2004. Scientific Farm Aimal Production. An Introduction to Animal Science. 8th Ed. Pearson Prentice Hall, New Jersey.

Tillman, A.D., H. Hartadi,S. Reksohadiprodjo, dan S. Lebdosoekojo. 1991. Ilmu Makanan Ternak Dasar . Gadjah Mada University Press. Fakultas Peternakan UGM, Yogyakarta.