NUSANTARA BIOSCIENCE
Vol. 1, No. 1, Pp. 23-30
March 2009

ISSN: 2087-3940 (print)
ISSN: 2087-3956 (electronic)

Body weight and statistic vital of Texel sheep in Wonosobo District by giving the ramie hay as an additional woof

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Manuscript received: 3 March 2008. Revision accepted: 30 June 2008.

Abstract. *Kuntjoro A, Sutarno, Astirin OP. 2009. Body weight and statistic vital of Texel sheep in Wonosobo District by giving the ramie hay as an additional woof. Nusantara Bioscience 1: 23-30.* This research is aimed to observe the body weight and statistic vital measurement of 50 Texel sheep. Sheep are classified into five treatments of giving woof P0 (giving tree greenish woof without concentrate), P1 (giving greenish woof and concentrate without adding the ramie hay/0%) concentrate), P2 (giving greenish woof and concentrate by adding 10%) ramie hay), P3 (giving greenish woof and concentrate by adding 20%) ramie hay), P4 (giving greenish woof and concentrate by adding 30%) ramie hay), every treatment was repeated 10 times. The result shows that even it can't yet replace the concentrate function, but adding ramie hay as much as 10%), 20%) and 30%) on sheep woof can increase the body weight's growth respectively 186.67 g/day, 153.34 g/day dan 103.34 g/day. The addition of ramie hay 10%), 20%) and 30%) can increase the addition of statistic vital's measurement on breast of sheep livestock 1.20 cm); 0.95 cm) and 0.90 cm); the addition of statistic vital measurement on the body length of sheep livestock 0.05 cm); 1.00 cm) and 0.75 cm) and also the addition of breast width is 1.50 cm); 0.15 cm) and 0.3 cm). Meanwhile the addition of ramie hay on livestock woof can only increase the addition of statistic vital mesurement on breast at giving 30%) as big as 0.15 cm). It is needed to know further on giving ramie hay by concentration comparasion of hay of different leaf and stem.

Key words: ramie hay, body weight, statistic vital, Texel sheep.

Abstrak. *Kuntjoro A, Sutarno, Astirin OP. 2009. Bobot badan dan statistik vital domba Texel di Kabupaten Wonosobo dengan pemberian limbah rami sebagai pakan tambahan. Nusantara Bioscience 1: 23-30.* Penelitian ini bertujuan untuk mengamati bobot badan dan pengukuran statistik vital dari 50 domba Texel. Domba dikelompokkan ke dalam lima perlakuan pemberian pakan, yaitu P0 (pakan hijauan, tanpa konsentrat), P1 (pakan hijauan dan konsentrat tanpa limbah rami/0%), P2 (pakan hijauan dan konsentrat dengan menambahkan 10% limbah rami), P3 (pakan hijauan dan konsentrat dengan menambahkan 20% limbah rami), P4 (pakan hijauan dan konsentrat dengan menambahkan 30% limbah rami), setiap perlakuan diulang 10 kali. Hasil penelitian menunjukkan bahwa meskipun belum dapat menggantikan fungsi konsentrat, penambahan limbah rami sebanyak 10%, 20% dan 30% pada pakan dapat meningkatkan pertumbuhan bobot tubuh domba masing-masing sebesar 186,67 g/hari, 153,34 g/hari dan 103,34 g/hari; juga meningkatkan statistik vital pada dalam dada domba sebesar 1,20 cm, 0,95 cm dan 0,90 cm; panjang tubuh 0,05 cm, 1,00 cm dan 0,75 cm; dalam dada 1,50 cm, 0,15 cm dan 0,3 cm. Sementara itu penambahan limbah rami pada pakan ternak hanya dapat meningkatkan penambahan ukuran statistik vital dalam dada pada pemberian rami 30% sebesar 0,15 cm. Perlu kajian lebih lanjut tentang pemberian limbah rami dengan berbagai konsentrasi limbah daun dan batang yang berbeda.

Kata kunci: sampah goni, berat badan, statistik vital, domba Texel.

INTRODUCTION

In Wonosobo district a kind of sheep, namely Texel, has been limitedly domesticated. This Texel, or locally named *dombos*, is a superior type of sheep which produces meat and wool with a fairly good quality. With the support of the potential areas available in Wonosobo District, it is easy to develop the farm of Texel sheep (*Ovis aries*) with excellent results, with relatively rapid growth and with the weight of the adult males can reach 90-100 kg, and adult females can reach 50-70 kg. With that consideration, many people raise them in their farm (Livestock Office of Wonosobo District, 2001, 2007).

Besides, Wonosobo is a producer of ramie plants (*Boehmeria nivea* (Linn.) Gaudich.), which are used as raw material for textiles (Brink dan Escobin 2003; Escobin 2005). Ramie (*Boehmeria nivea Gaudich*) is a typical textile raw material in China (Bally 1957) and used for Chinese burial shrouds over 2,000 years and also used in mummy cloths in Egypt about 3000-5000 years BC. It is used for the production of textiles and ropes because it is extremely absorbent, dries quickly, dyes fairly easy, resists shrinkage, and is unusually tolerant with bacteria, mildew and insect attacks (Wang et al. 2007). Ramie has long been used in Indonesia, the kingdom of Majapahit mentioned ramie among the goods brought from China (Yoshimoto 1988). Rami is very important. Many research have bbeen

done to increase production by phytohormones (Prayudhiani 2000; Wang et al. 2007), microorganisms (Mayerni 2004), in vitro propagation (Wang et al. 2008), and even genetic engineering (Dusi et al. 1993).

Currently, ramie hay is just thrown away or used as fertilizer in Wonosobo. While ramie has the necessary nutrients that cattles need, ramie leaf hay has a relatively high protein content (24%), so that when they are mixed as animal feed ingredients, they can increase the efficiency for the food costs (Agrina Prima 2006). Ramie plants are suitable to be planted in Indonesia at the ideal height of 400-1500 m asl (above sea level), with daily temperature 20-27^{o}C and rainfall > 140 mm/month evenly throughout the year, open-structured soils such as clay, sand lightly with a pH of 5.6 to 6.5 by ages productive 6-8 years, harvested 5-6 times a year (Dempsey 1975; Sudiro 2004). This plant has a drought tolerant cultivar (Liu et al. 2005). Fiber productivity are highest in the highlands (> 700 m asl.), 2.5 to 3.0 tons/ha/year, followed by mainland medium (400-700 m asl.), 2.0 to 2.5 tons/ha/year, and lowlands (400 m asl.), 1.5 to 2.0 tons/ha/year (Setyo-Budi et al. 2005). Intensive cultivation of ramie in Bogor, can produce up to 4.5 tons/ha/year, and crop yields have increased in the following year, in order to obtain an average production of 5.0 tons/ha/year, with leaf and stems production ratio of 45% and 55%.

Ramie leaves contain protein, fat and high fiber, so as to improve the nutritional value of feed when used as a concentrate (Sastrosupadi 2004). Provision of ramie on a small cattle no significant negative effect, but granting ramie above 30 kg/day in dairy cows resulted in wet eczema disease in the legs (Lahiya 1984). Dinh et al. (2007) states that ramie good fresh whole plants or parts of it have leaf crude protein (> 21% dry weight and ash (19-22% dry weight) is high, drying can reduce the crude protein content. The coefficient of digestibility of organic matter, crude protein and fresh leaves of ramie fiber, respectively, 78.5, 80.9 and 82.6%, while the dried leaves, respectively, 63.1, 60.6, and 76.1% and in all their fresh crops respectively are 66.1, 75.9, and 62.5%, so that ramie has a high nutritional value for ruminants.

Animal feeding is one factor that is very strategic for the success of poultry farms, because it contributes ± 70% of the total production cost (BPTP 2000). Potential agricultural waste can be used as concentrate feedstuffs. Waste is always associated with low prices, but there are some things to consider in its utilization of continuity, availability, nutrient content and the possibility of limiting factors such as anti-nutritional substances and whether or not the material is processed before it can be used as feedstuffs (Mathius and Sinurat 2004 .)

Physiologically, sheep require roughage in their feed, especially coming from forage such as fresh grass, hay, silage or hay and grain mixtures containing minerals and vitamins. Twigs, branches from trees and shrubs can be used as food additives for the sheep beside fresh grass and forage (Hanafi 2004). Sheep food is in the form of food concentrates and forages. Greenery is good forage that has more fiber content of 18% which is a natural food for ruminants, either in the form of grasses consisting of grass and grass field as well as the form of superior legume. Concentrate is a kind of food with a high protein content and low crude fiber content (Sofyan and Lili 2000).

For growth, production, reproduction and basic living, animals need nutrients. Fattening aims to produce a high and efficient weight gain and to produce a high-quality carcass, then it is needed the food that contains high nutrition, because livestock production would increase if the nutrient content of food increased (Tillman et al. 1991). Concentrates can stimulate the growth of beneficial bacteria in the rumen forage digestion that in turn increases the body weight (Dirdjopranoto et al. 2007).

Protein is essential for life because these substances are active protoplasm in all living cells (Anggorodi 1990). Protein plays an important role in the process of growth, production and reproduction. According to Tillman et al. (1991) growth is generally expressed by the measurement of weight gain, carried out by weighing repeatedly and checking the growth of body weight every day, every week or every other time. Growth stages which have fast and slow stages. The fast phase occurs at the time of puberty and the slow phase occurs when the animals have reached adult ages. Meanwhile, according Sugeng (2000) to assess the outer form of the animals, the measurements of certain parts such as body length, width and in the chest, chest circumference and height are carried out.

This study is aimed to determine weight gain and measurement of vital statistics including chest circumference, body length, high gumba, in the chest and chest width on the sheep of Texel after the addition of ramie hay on the additional food.

MATERIALS AND METHODS

Time and place

The experiment was conducted in the farmland belonging to *Bina Tani* group at Tegalgot Village, Kepil Subdistrict, Wonosobo District, Central Java. The experiment was conducted from September until October 2007. Preparation of concentrate food was carried out in the Fooder Factory Mill belonging to *Bina Tani*, Wonosobo. Proximate analysis of food was carried out at the Laboratory of Animal Nutrition and Feed, Department of Animal Science, Faculty of Agriculture, Sebelas Maret University, Surakarta.

Materials

The sheep used in this research was cross-fertilization between Texel sheep and cattle belonging to a group of local sheep of *Bina Tani*, Tegalgot Village, Kepil Sub-district, Wonosobo District, with the age of 80-10 months, consisting of 50 animals with the weight of 14-25 kg.

Cage used as research material is the one owned by farmers of *Bina Tani* group with the size of 40 cm x 120 cm consisting of 50 cages.

Forage was obtained by *Bina Tani* group members by finding the form of forage grass and Leguminous that are available around the Village area Tegalgot, District Kepil,

with each group member brought a basket weighing about 30 kg.

Concentrates were obtained from the forage factory owned by *Bina Tani* group under the technical supervision of the Faculty of Animal Science, Gadjah Mada University, Yogyakarta, and Office of Animal Husbandry and Fisheries of Wonosobo District.

The ramie in the form of leaves and stems (45%: 55%) in dry condition (moisture content 10-15%), was obtained from the farmers' ramie and ramie-processing factory of PT. Prima Agrina, Wonosobo.

Experimental design

The research design used a completely randomized design with 4 treatments in the form of food concentrates and the addition of ramie hay (0%, 10%, 20%, 30%), as control animals given only greenery. Each treatment and control was carried out with 10 replications for observation time 0 week, 2 weeks and 4 weeks.

Procedures

Food making

The addition of ramie hay in the concentrate is mixed homogeneously using a machine (mixer) of the factory by mixing the following:

P0 = forage alone.

P1 = concentrate without the addition of ramie hay;

P2 = 90% concentrate plus 10% ramie hay;

P3 = 80% concentrate plus 20% ramie hay

P4 = 70% concentrate plus 30% ramie hay

To know the nutrient content of the food concentrate for each treatment (addition of ramie hay 0%, 10%, 20% and 30%) we conducted the proximate analysis at the Laboratory of Animal Nutrition and Feed, Faculty of Agriculture, Sebelas Maret University, Surakarta.

Feeding

The five groups of animals (P0, P1, P2, P3, and P4) were given forage in sufficient quantities as needed (± 20% of body weight) or about 4 kg/day and the feeding was done twice a day morning and afternoon. Providing additional food and concentrates were given to the groups of animals (P1, P2, P3, and P4) in sufficient quantities as needed (± 2.5% of body weight) or 500 g/day and administered twice a day, given before the greenery was given.

Weighing the body's weight

Weighing done with scales (dacin) by placing animals in ramie sacks that have been specially made. Weighing is done three times, namely before the start of treatment (0 weeks), after the research had been carried out for 2 weeks and at the end of the study (4 weeks).

Measurement of vital statistics

Measurements made with dipsticks and metline. The chest line was measured by using the metline encircling the chest at the back of the shoulder. The length of the torso was measured by using the dipstick which was the distance between the front edge of the shoulder joint and the filter bone. The height of gumba was measured with dipstick of the highest part of gumba to the ground following the perpendicular line. The inner line of the chest is measured by using a dipstick by drawing a vertical line between the edge of the back and the chest. The width of the chest is measured by using a dipstick by drawing a horizontal line between the outer edge of the left and right shoulder joints.

Data analysis

The data obtained was analyzed by using the analysis of variance (ANOVA) one way with the observed variables of body weight and vital statistics of the sheep, then the further tests with LSD were conducted.

RESULTS AND DISCUSSION

Nutritional content of the food

Test results proximate of nutrient content of the food given in this trial are presented in Table 1.

Table 1. Nutrient content of the foods given in the research.

Treatment	Composition	Crude protein	Crude fiber
P1	without ramie	13.84%	11.61%
P2	added by 10% ramie	13.14%	13.95%
P3	added by 20% ramie	12.64%	14.61%
P4	added by 30% ramie	11.02%	15.29%

Protein is essential for life, because these substances are active protoplasm in all living cells (Anggorodi 1990). Protein has an important role in the process of growth, production and reproduction. The protein content of ramie leaves is 24-26%, 5-6% for fat; 25-30% for Phosphorus, 5-6% for calcium, 36-46% for carotene (Sudiro 2004). Protein has an important role in the process of growth, production and reproduction. The needs of the rude protein for the sheep range from 12.5 to 14.4% from the rations (BPTP Ungaran 2000), while according Anggorodi (1990) protein content of leguminosa ranges from 14.3 to 17.4% and the one of grass ranges from 4.3-10.3%, so the feeding should be mixed with legume and grass or other supplementary food.

High fiber content can inhibit the growth of the animals. According to Hanafi (2004) twigs, branches from trees and shrubs can be used as food additives other than fresh grass and other greenery. However, the selection of the food ingredients should consider possible limiting factors such as nutrition and the anti nutrient material whether or not it is processed before it can be used as food (Mathius and Sinurat 2004). According to Sutardi (1980), the lignin content of the greenery is closely related to the benefits of fodder. If the rate is high, then the coefficient of food digestibility related to the benefits of forage is low.

Texel sheep body weight

In this study, the initial data is the result of the initial weight of the animals gained by weighing all the sheep to

determine the initial weight of each treatment. The initial weight of Texel sheep throughout the study group had a range of 14-25 kg with an average body weight of 20 kg. Texel sheep with body weight of the observation period of 2 weeks after treatment had a range of 16-28 kg with an average body weight of 23.48 kg. Texel sheep's body weight of the observation period of 4 weeks after treatment had a range of 18-29 kg with an average body weight of 25.86 kg (Figure 1).

The highest average initial body weight (0 weeks) is in the group given with the addition of ramie hay by 30% which was P4 (21.3 kg), and then flowed by P0 and P3 (which had a weight of 20 kg), and P1 (19,6 kg). The results of weighing the average body weight on the second week obtained the highest body weight which was P4 (23,6 kg), followed by P1 (23,5 kg), P2 and P3 (22,9 kg), and then the lowest was P0. The result of weighing the average body weight after 4 weeks was that highest body weight was gained by P1 (26,4 kg), then consecutively followed by P2 (24,7 kg), P3 (24,6 kg) and P4 (24,4 kg) and the lowest achieved by P0 (22,4 kg).

The body weight Texel sheep on all treatments shows different increase in the body weight. The highest weight was gained by P1 (213,34 g/head/day), followed by P2 (186,67 g/head/day), P3 (153,34 g/head/day), and P4 (103,34 g/head/day), while the lowest was P0 (96,67 g/head/day). The highest percentage of the increase in body weight was achieved by P1 (32%), followed by P2 (29,32%), P3 (23%), while the lowest was P4 (14,55%). It is below the average daily gain control group which was 18.37% (Figure 2).

From Figure 2, it can be concluded that the Texel sheep which has been researched are still below the standard weight gain of the pure species of Texel sheep, but already above the ones treated with additional food for fattening sheep given with ramie hay carried out by The Office of Animal Husbandry and Fisheries of Wonosobo District in 2005 which only gained 71 g/head/days. This situation can occur because the sheep which is used in the research the result of cross-fertilization of the Texel sheep species for the fattening project. Standard average weight gain for the pure species of Texel sheep is 300 g/day, with the test results on individual growth varies between 250 and 540 g/day (Anon 2000). According to Sodiq and Abidin (2002) the highest daily growth could be gained with the weight gain of 0.3 kg per day. Average daily weight gain that can be achieved with intensive maintenance is 0.2 kg per day.

In the efforts of cattle fattening, growth is an important goal. Excess food from basic living needs will be used to increase the body weight. The cattle's weight gain reflects the extent of the benefits of food given to the cattle (Hanafi 2004). After multiple comparison tests between the means using the LSD method, it is showed that the significance difference in the control group with each treatment was only found in P1 and P2. This is proved from the results of the test for each mean of which all have significance under 0.05 (P, 0.05). Thus it indicates that the treatment of giving the 10% and 20% of ramie hay has significant impact ($P < 0.05$) on weight gain for the Texel sheep. Besides, according to Gabbi et al. (2004) the increase in the supply of ramie hay to fattening White New Zealand rabbits has a negative response on the productive performance of animals, when those already receive high levels of fiber on the diet. According to de Toledo et al. (2008) the combination of ramie and alfalfa hays, as main fiber source ingredient in the diets of rabbits, caused a positive synergic effect and improve growth performance.

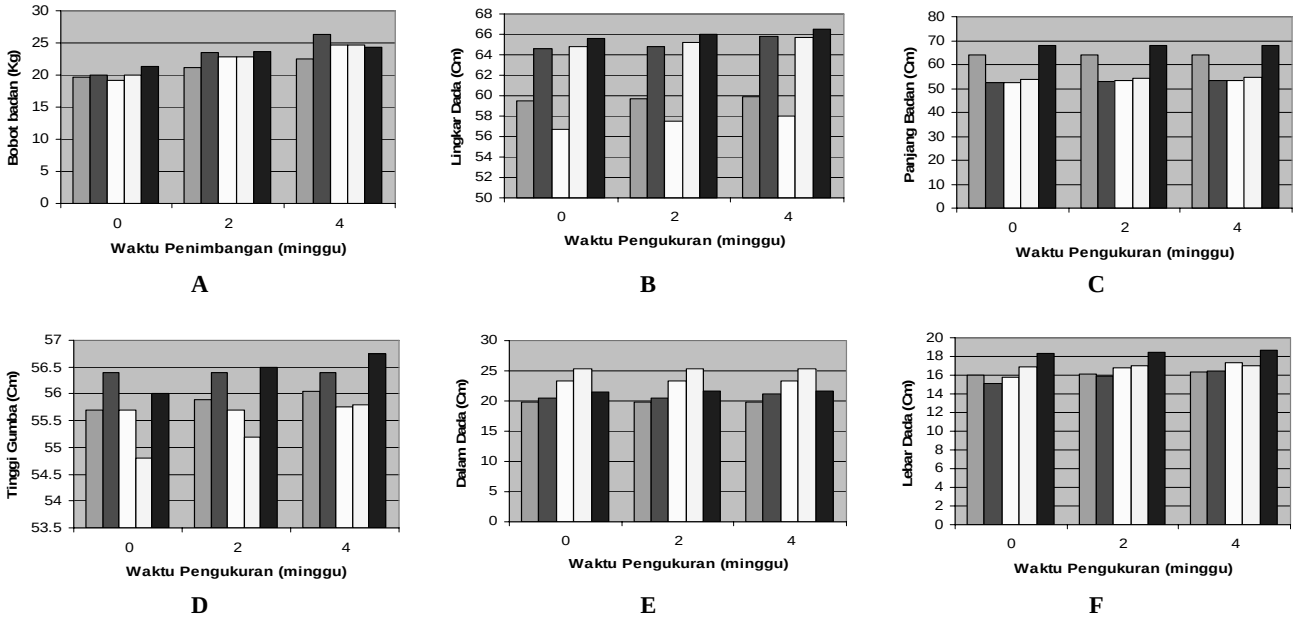

Figure 1. The average frequency distribution measurements of Texel sheep according to the treatment period. A. body weight of sheep, B. chest circumference, C. body length, D. high gumbai, E. inner chest, F. chest width.

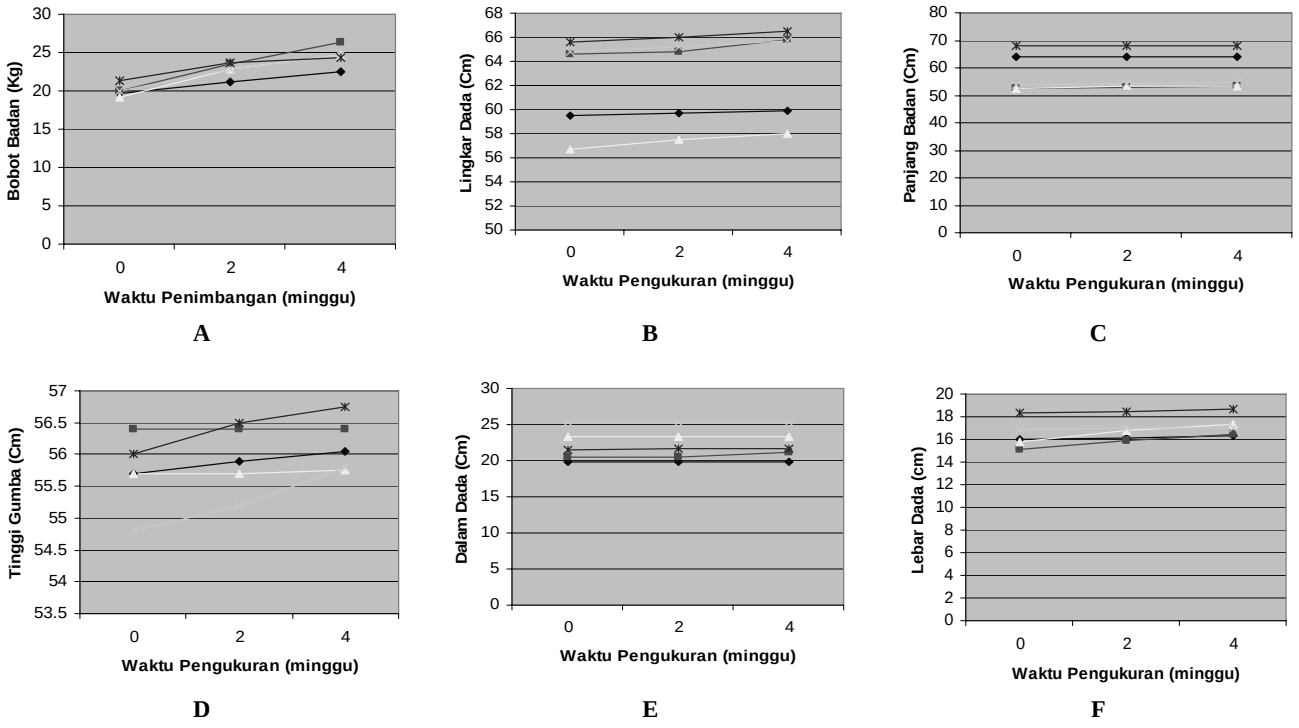

Figure 2. The average percentage increasement in Texel sheep on each treatment. A. body weight of sheep, B. chest circumference, C. body length, D. high gumbai, E. inner chest, F. chest width. P0: ♦ , P1: ■ , P2: ▲ , P3: X , P4: *.

The data of body weight increase in Figure 2 shows that the greater the addition of ramie hay means the more negative impact on the weight gain. This situation is caused by a decrease in protein content of the food given with the additional ramie hay, even though the food given is already in accordance with the needs of the sheep.

Vital statistics of the Texel sheep

Chest circumference

The average chest circumference of Texel sheep at the beginning, middle and end of treatment is presented in Figure 1. The highest average of chest circumference of Texel sheep at the beginning of treatment (0 weeks) is at P4 (65.6 cm), then at P3 (64.8 cm), P1 (64.6 cm), and P0 (59.45 cm), while the lowest is at P2 (56.75 cm). The measurement results on average chest circumference after two weeks of treatment shows the highest chest circumference is at P4 (66 cm), followed by P3 (65.15 cm), P1 (64.8 cm) and P0 (59.85 cm), and the lowest average of chest circumference was obtained at P2 (57.45 cm). The measurement results on average chest circumference after four weeks of treatment achieved the highest chest circumference at P4 (66.5 cm), followed by P1 (65.85 cm), P3 (65.75 cm), P0 (59.7 cm) and the lowest at P2 (57.95 cm).

Chest circumference of Texel sheep on all treatments shows a different increment. The highest chest circumference is reached at P1 (1.25 cm), followed by P2 (1.2 cm), P3 (0.95 cm), and P4 (0.9 cm), whereas the lowest is at P0 (0.40 cm). The highest increment percentage of chest circumference is achieved in P1 (1.25%), followed by P2 (1.2%), P3 (0.95%), P4 (0.9%), while the lowest is at P0 (0.4 %) (Figure 2).

The results of Anova further test with LSD show that the addition of ramie hay 10%, 20% and 30% can increase the vital statistics growth of each Texel sheep chest circumference of 1.20 cm, 0.95 cm and 0.90 cm. This situation is caused by degradation of feed protein and increment of feed crude fiber due to the addition of ramie hay. The addition of ramie hay in cattle feed lowers the percentage of protein content of feed and increases feed crude fiber, where protein plays an important role in the process of growth, production and reproduction.

Body length

The average body length of Texel sheep at the beginning, middle and end of treatment is presented in Figure 1. The highest average body length at the beginning of treatment (0 weeks) is found in P4 (67.8 cm), then in P0 (63.9 cm), in P3 (53.8 cm), while the lowest is in P1 and P2 (respectively, 52.4 cm). The result of measuring the average body length on two weeks after treatment obtain the highest body length is on P4 (68.15 cm), followed by P0 (64.05 cm), P3 (54.6 cm), P2 (53.2 cm) and the lowest is at P1 (53 cm). The measurement results of average body length four weeks after treatment show the highest body length is P4 (68.15 cm), then P0 (64.1 cm), P3 (54.6 cm), P1 (53.55 cm), and the lowest is P2 (53.45 cm).

The average body length of Texel sheep on all treatments shows different increment. The highest average length increment of sheep is at P1 (1.15 cm), followed by P2 (1.05 cm), then P3 (0.8 cm) and P4 (0.35 cm), while the lowest is at P0 (0.2 cm). The highest increment percentage on body length is achieved in P1 (2.19%), then P2 (2%), P3 (1.49%), and P4 (0.52%), while the lowest is in P0 (0.31%) (Figure 2).

The results of Anova further test with LSD show that the addition of ramie hay of 10%, 20% and 30% in the feed can increase the vital statistics addition of body length, consecutively, of 1.05 cm, 0.80 cm and 0.35 cm. The decrease condition is caused by the degradation of feed protein and crude fiber increment on feed due to the addition of ramie hay.

Wither's height

The wither's average height of Texel sheep at the beginning (0 weeks), middle (2 weeks) and end of treatment (4 weeks) is presented in Figure 1. At the beginning (0 week), the highest average of withers height is found in P1 (56.4 cm), then P4 (56 cm), P0 and P1 (respectively, 55.7 cm), whereas the lowest is in P3 (54.8 cm). The result of withers average height measurement two weeks after treatment shows that the highest withers height is at P4 (56.5 cm), followed by P1 (56.4 cm), then P0 (55.9 cm), P2 (55.7 cm), and the lowest is at P3 (55.2 cm). The result of withers average height measurement four weeks after treatment shows that the highest withers height is at P4 (56.75 cm), followed by P1 (56.4 cm), P0 (56.05 cm), P3 (55.8 cm) and a the lowest is at P2 (55.75 cm).

The withers average height of Texel sheep on all treatments shows different increment (Figure 2). The highest increment of withers height of sheep is at P3 (1 cm), followed by P4 (0.75 cm), P0 (0.35 cm), and P2 (0.05 cm), whereas P1 did not experience any withers height increment. The highest percentage of withers height increment is achieved in P3 (1.83%), followed by P4 (1.34%), P0 (0.63%), and P2 (0.09%), whereas P1 does not increased at all.

The Anova further test results with LSD shows that the addition of ramie hay of 10%, 20% and 30% in the food can increase the vital statistics addition of withers height of each treatments by, consecutively, 0.05 cm, 1.00 cm and 0.75 cm. The increase which is relatively limited is due to the reduced protein content of food and the increase of crude fiber as a result of ramie hay additions.

Inner part of chest

The average of inner part of chest of Texel sheep at the beginning (0 weeks), middle (2 weeks) and end time of treatment (4 weeks) is presented in Figure 1. Measurement of the average inner part of chest at the beginning of treatment (0 weeks) are highest at P3 (25.3 cm), then P2 (23.3 cm), P4 (21.5 cm), P1 (20.5 cm), while the lowest was in P0 (19.8 cm). Results of average measurement of inner part of chest two weeks after the treatment shows the highest is on P3 (25.3 cm), followed by P2 (23.3 cm), P4 (21.6 cm), P1 (20.5 cm), and the lowest at P0 (19.8 cm). Results of average measurement of inner part of chest four weeks after treatment shows the highest achievement is at P3 (25.3 cm), followed by P2 (23.3 cm), P4 (21.65 cm), P1 (21.15 cm), and the lowest is at P0 (19.85 cm) (Figure 2).

The highest average addition of inner part of chest is reached at P1 (0.65 cm), followed by P4 (0.15 cm) and P0 (0.05 cm), while P2 and P3 does not experience any increment. The highest percentage increment of inner part of chest is achieved in P1 (3.17%), followed by P4 (0.69%), P0 (0.25%), while P2 and P3 not increased (Figure 2).

The Anova further test results with LSD show that the addition of 30% ramie hay in feed can increase the vital statistics addition of inner part of chest (0.15 cm), whereas other treatments give no significant effect. This situation is caused by the degradation of feed protein and crude fiber increment on feed due to the addition of ramie hay.

Chest width

The average chest width of Texel sheep at the beginning of treatment (0 weeks), middle of treatment (2 weeks) and end of treatment (4 weeks) is presented in Figure 1. The measurement of the average width of the chest at the beginning of treatment (0 weeks) shows the highest number is found in P4 (18.35 cm), and P3 (16.9 cm), P0 (15.95 cm) and P2 (15.8 cm), while the lowest is at P1 (15.15 cm). Chest width average measurement results on two weeks after treatment show the highest chest width is at P4 (18.45 cm), followed by P3 (17.05 cm), P2 (16.8 cm), P0 (16.2 cm), and the lowest is at P1 (15.9 cm). Chest width average measurement results after four weeks of treatment show the highest chest width is at P4 (18.65 cm), then P2 (17.3 cm), P3 (17.05 cm), P1 (16.5 cm), and the lowest is at P0 (16.3 cm).

The average chest width of Texel sheep in each treatment represents different increments (Figure 2). The highest increment of sheep chest width is at P2 (1.5 cm), followed by P1 (1.35 cm), P0 (0.35 cm), P4 (0.3 cm), while the lowest is in P3 (0.15 cm). The highest percentage of chest width increment is achieved by P2 (9.49%), followed by P1 (8.91%), P0 (2.19%) and P4 (1.63%), while the lowest is in P3 (0.89 %). Considering the vital statistics data of Texel sheep, it appears that the size of vital statistics of research sheep is still below the class D standard measure of vital statistics on Texel sheep with 2.5 years of age i.e. the chest circumference is 80 cm, withers height is 65 cm and 65 cm of body length (Office of Animal Husbandry and Fisheries of Wonosobo District 2007).

The Anova further test results with LSD shows that the addition of ramie hay of 10%), 20%) and 30%) in the food can increase the vital statistics addition of chest width, each for 1.50 cm); 0.15 cm) and 0.30 cm). This situation is caused by degradation of feed protein and increment of crude fiber in the feed due to the addition of ramie hay.

After the data analysis with one-way Anova is performed to all the calculation results obtained in all treatment, it is obtained the value of statistical test, i.e. $F_{obs} > F\alpha$, thereby H_{0A} is rejected, while H_{1A} is accepted. Thus, the results of these tests show that there are significant differences among all treatments on body weight and size

of the vital statistics including chest circumference, body length, withers height, inner part of chest and chest circumference of Texel sheep on each treatment. Anova further test results with LSD show that the addition of ramie hay will increase body weight and size of the statistics vital.

Economic calculation

The result of observation toward the addition of ramie hay in the food given to the Texel sheep shows the economic cost of food as presented in Table 2. Economically, though not yet to replace concentrate food, but the maintenance of Texel sheep with the addition of ramie hay by 10%, 20% and 30% can reduce the costs of the food from Rp 330,000, - to Rp 319,000, -; Rp 309,000, - and IDR 298 000, - and gained the profit per head of for each sheep Rp 52,050, -; Rp 38,100, - and Rp 16,650, -. While the maintenance of sheep by feeding them with concentrates without any additional food of ramie hay gained a benefit of Rp 63,000, - and the sheep fed only with greenery alone without giving concentrates gained a profit of Rp 28,500, -. This situation is caused by the cost of feed control group, P1 (without hay of ramie), P2 (the addition of ramie hay 10%), P3 (ramie hay 20%) and P4 (30% ramie hay) respectively IDR 150,000.00/month; Rp 330,000.00/month; IDR 319 500.00/month; IDR 309,000.00/month and Rp 298,500.00/month. The cost of feed is treated with grass price of Rp 3,000.00/buckets (for 6 heads), concentrates IDR 1,200.00/kg and ramie hay price IDR 500.00/kg and livestock prices Rp 15,000/kg body weight.

Tabel 2. Economic analysis of sheep feed costs by treatment.

Treatment	Prices feed (IDR)	Added body weight (kg)	Price sheep (IDR)	Advantages (IDR)
P0	150,000	29	435,000	285,000
P1	330,000	64	960,000	630,000
P2	319,500	56	840,000	520,500
P3	309,000	46	690,000	381,000
P4	298,500	31	465,000	166,500

CONCLUSION

The highest weight gain of sheep was achieved by the group with the additional food of ramie hay respectively 0%, 10%, 20% and 30%. Though not yet able to replace the function of the concentrate, but the addition of ramie hay as much as 10%, 20% and 30% in food increases the weight gain of sheep for each percentage 186.67 g/head/day, 153.34 g/head/day and 103 , 34 g/head/day. The increased size of the vital statistics of chest line, body length and chest width is achieved by the additional of ramie hay in the cattle food as much as 0%, 10% and 20%, while the highest body height was reached by the group with the additional food of 20% and 30% ramie hay, and the highest chest width was achieved by the group with the additional food of 0% and 30% ramie hay.

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