Growth performance of Ongole grade *(Peranakan Ongole)* cattle in Indonesia[1]

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ABSTRACT: Despite the increase in numbers of imported cattle in villages in Java, Ongole grade *(Peranakan Ongole*) cattle are still the major breed kept by small scale farmers. Farm income is dependent on the performance of the animal and the cost of feed and labour. This paper describes the growth performance of Ongole grade cattle based on the results of reported experiments. Results of feeding trials from experiments comprising 71 dietary treatments and different classes of Ongole cattle have been analyzed to find out the characteristics of the growth performance. Growth rates of Ongole cattle ranged from 0.2 to 1.2 kg/d and were influenced by feed type, dry matter intake and class of animal. Feeding agricultural residues such as rice straw does not support optimal production unless animals are also offered a high energy or protein supplement such as leguminous foliage or industrial by-products (e.g. rice bran). Pre-treatment of straw also improved the nutritive value of the diet and resulted in a better performance of the cattle. The requirement of dietary protein and the protein utilization needs further attention. The availability of feeds throughout the year was considered as an important factor that should be solved.

Key words: growth, Ongole Grade, feeds, straw, nutrition

INTRODUCTION

Efficiency of animal production is affected by the genetic potential of the animal and environmental factors, including nutrition, health and climate. Different breeds of cattle have different performance characteristics. Despite the increase in numbers of imported cattle in villages in Java, Ongole Grade (Peranakan Ongole) cattle are still the major breed kept by small scale farmers. This review will concentrate on the effects of nutrition on the performance of Ongole Grade cattle in Indonesia.

Cattle in most areas of Indonesia are fed a diet comprised of native grasses, leguminous foliages and some agricultural residues and by-products, including rice straw, corn stover, sugarcane tops, and oil palm by products. Quantity and quality of feed available in relation to the requirement of the animal should be adequate to meet the genetic potential need. Below this level then the productivity of the animal will be lower than those being expected. Higher than the requirement will be wasted because the extra feed will not be efficiently utilized (Ørskov, 1982). It is necessary that the feeding level, in terms of quantity and quality, should be appropriate for the physiological state of the animal and expected level of animal production. That is why strategy of feeding management is necessary.

A lot of experiments have been carried out in many research institutions such as those in universities and departmental research institutions. Results of these experiments showed variable performances of the animal depending at least on the animal physiological conditions, dietary treatments and feeding management. Data from such experiments are expected to become excellent information for planning subsequent experiments in order to have an appropriate management of the existing cattle based on local environmental conditions. Therefore, the following section of this paper is devoted to describe the available information regarding to the performance of Ongole Grade cattle obtained from several experiments either in universities or research institutions of technical department.

[1] The authors greatly appreciate the support of ACIAR in making this paper available under the Project No. LPS/2008/038.

GROWTH OF ONGOLE CATTLE

The genetic potential of Ongole cattle in terms of body live weight may reach more than 400 kg at mature stage (Astuti, 2004). The growth rate in general is within the range from 0.2 to 1.2 kg /d depending on the management. The average daily weight gain from weaning to 1.5 yr of age is only 0.6 kg. The lower growth rates reported were due to lack of good quality feed, in addition to inadequate quantity of the feed to meet the daily nutrient requirement. During the dry season, the lack of feed availability is more pronounce in most part of Indonesia and therefore the animals are not performing well.

In an intensive system, however, Ongole Grade cattle show a better production, not only in terms of weight gain, but also of good quality meat (Mahendri et al., 2006). Data from Yusuf (2003) indicated a curve of body weight of one year to 3 years old Ongole Grade cattle as shown in the following Figure 1. This figure indicates that rough calculation of the average daily gain is only 0.17 kg.

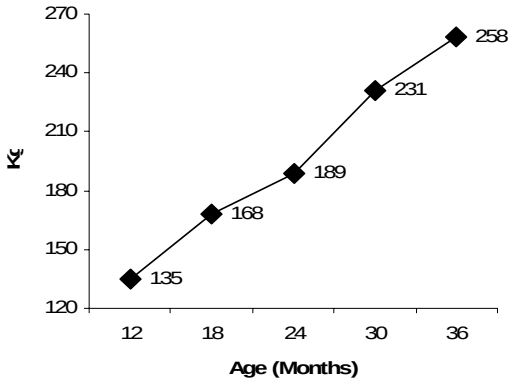

Figure 1. Growth curve of Ongole Grade cattle 1-3 years old (Yusuf, 2003)

Reported research results indicate that the performance of cattle in terms of growth rate were in the range between 0.2 to 1.2 kg/d with a mean of 0.6 kg. Effects of dietary treatments seem to be significant within a wide range of environmental conditions, such as temperature and humidity. Natural grasses without supplementation of protein show less affect the animal performance. Higher concentrate feeding, up to 85% of the total ration can force the animal to gain better which can reach 1.0 kg/d. Feeding cattle with rice straw as the solely feeds did not gain any weight (Utomo, 2004). Leguminous foliage supplementation on rice straw fed cattle did not improve the productivity sisgnificantly. The leguminous foliages such as *Leucaena leucocephala, Gliricidia sepium, Caliandra callothyrsus*, and *Sesbania grandiflora* were mostly given as supplement to grasses. The results of those experiments are described in the following chart (Figure 2), where the x-axis is representing the documented data of reported observations.

The use of rice straw as the basal fibre source for Ongole grade cattle was not adequate to maintain the zero growth, unless supplementation was provided (Utomo, 2004). The supplements may be in the form of rice bran (Bonga, 2003), tapioca waste (Suhartanto, 1982), leguminous foliages (Utomo, 1986; Utomo and Soejono, 1996), and tofu waste (Murdjito, 1995). The use of treated rice straw whether by ammoniation, fermentation or chemical techniques for cattle indicated varied responses to weight gain.

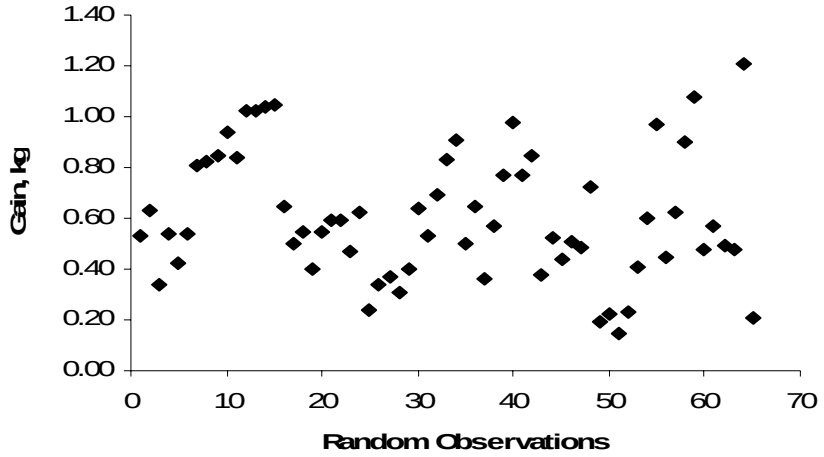

Figure 2. Distribution of performance of Ongole Grade cattle

FEEDING MANAGEMENT

Small-scale farmers in Java usually keep their animals inside their house or in a separate *kandang* close to their home. This style of housing makes optimal use of limited free space, provides security for the animals from thieves, and allows farmers to keep a close watch on their animals.

In East Java, Ongole cattle spend most of their time inside the kandang (when not used for draught), and are fed mostly by the 'cut and carry' system (Komarudin-Ma'sum et al., 1993). Feeding of cattle is usually carried out by the farmers' wife, who collects forages from around the village. Diets based on native grasses, weeds, tree legumes and crop residues (e.g. rice straw and corn stover) are common because these feeds are readily available and have a low cost. This basal diet is also sometimes supplemented with higher energy and protein feeds such as rice bran or cassava meal.

In West Java, Ongole cattle are fed both by 'cut and carry' and grazing (Santoso et al., 1993). A group of cattle being herded to a paddy field after the rice is harvested is a common sight. In some places, forest areas are also used by nearby farmers to let their cattle graze the available forages under the trees.

Feed quantity and quality are both limiting factors for productivity of Ongole cattle. When forages are difficult to collect, farmers are forced to buy whatever feed is available from local suppliers. Preservation and storage of forages within the kandang can provide a feed bank for times when the farmer does not have enough time to collect feed for the cattle, or feed is not otherwise available.

Adequacy of dry matter to meet the daily requirement does not mean that the problems of feed have been solved. To support a better animal production, the more important thing is that the nutrient in feed dry matter, such as protein, polysaccharides, vitamins and minerals should be available in adequate and balanced quantity. The nutritive value of low quality feeds such as rice straw can be improved by simple treatments, such as treating with sodium hydroxide, ammonia or urea (Van Soest, 2006). However, an analysis by the Indonesian Centre for Agro Socio-Economic Policies and Studies in 2007 suggested that treated rice straw was not widely adopted because the treatment methods were not profitable and the procedures complicated.

Analysis of data collected from several reports indicates that the requirement of feed dry matter for maintenance, is 2.285 kg /d, and the requirement for getting 1.0 kg daily weight gain, there should be 9.584 kg feed dry matter consumed. This is based on a simple linear analysis between daily dry matter intakes versus daily weight gain, as illustrated in Figure 3.

Protein is an important substance that should be available in the ration. However, ruminants do not need true protein in their diets as they can use non-protein nitrogen (NPN) as source of protein by the help of rumen microbial activity. The strategic feeding of protein in ruminants should be directed to feed with low rumen degradable protein; however, the production of microbial protein should be increased so that these microbial mass can be used as source of amino acids after the microbial protein are being hydrolyzed in the lower digestive tract. Protecting feed protein from rumen degradation, will increase the efficiency of protein utilization.

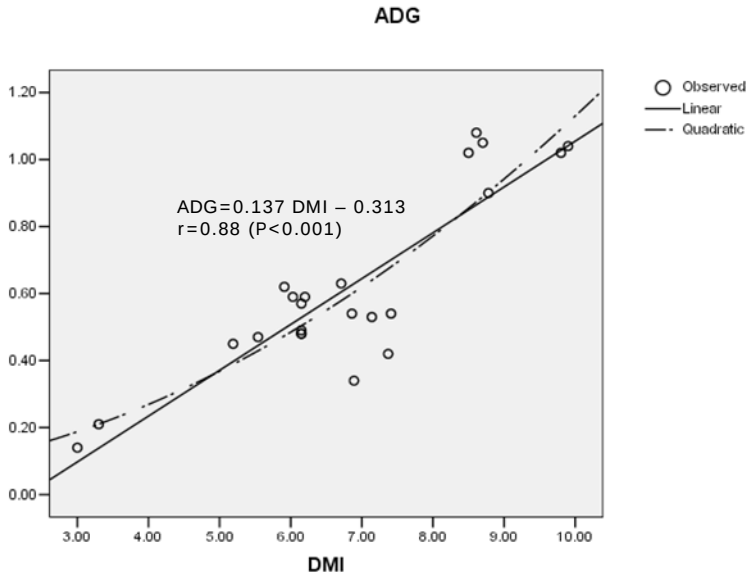

Figure 3. Relationship between average daily gain and dry matter intake

CONCLUSIONS

Feeding cattle based on the live weight and the expected level of production could be applied for efficient feeding system. By this system, there will be no excess feeds given than those required for the production. In addition, the level of protein in the diet should be slightly modified so that major parts of the protein will not be degraded in the rumen; however these proteins are still degradable in the lower digestive tract. The use of locally available feedstuffs should also be encouraged to reduce the cost of transportation. Manipulating the feedstuffs quality by pre-treatments should be tried before being fed to the animal.

Activities for subsequent experiments should be directed to look at the possibility of increasing the efficiency of feeding cattle using locally available feedstuffs with or without pre-treatments to improve their nutritive value before being fed to the animal. Supplementation with feed additives, non-protein nitrogen, leguminous foliages, rice bran or other higher nutritive value feedstuffs which are readily available in the nearby location should be examined further.

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