INTRODUCTION
To anticipate the problem of forage shortage during dry season in Indonesia, the usage of unconventional feedstuffs such as agricultural crop residues (Utomo, 2015) and livestock waste as feed is one of the strategies that can be applied. This strategy may optimize the use of natural resources for the benefit of livestock production in concern with environment sustainability (Anonymous, 1996). One of livestock waste that can be used as a feed substitute for forage basal feed is rumen contents from slaughter houses, which until now was discarded or only used as organic fertilizer. The increase of slaughtered cattle to meet the needs of meat was followed by raising amount of rumen contents, which causing pollution problems in urban areas. Each cattle slaughtered would produce about 24.5 kg of fresh rumen contents or 3.8 kg in dry matter, since they contain 15.5% dry matter (Witherow and Lammers, 1976). The use of rumen contents from a slaughter house as feed for cattle have been reported by Messermith (1973) which used rumen content in the ration up to 15% and produced similar average daily gain (ADG), feed consumption, feed efficiency, and feed conversion compared to those fed with control ration.

Ensilage is one of the ways to prevent spoilage, maintain nutritional value, and in this case can eliminate the typical odor of rumen contents. Ensilage is a preservation method performed by fermentation process. The main products in the ensilage are lactic acids which act as preservatives. To increase the dry matter of rumen contents for ideal ensiling (35% DM), dried cassava pomace has been added, while molasses was added to increase the water soluble carbohydrate content.

This study was done to determine the effect of using rumen contents silage as a substitute for basal feed (forage) in beef cattle ration on production performance and carcass percentage of Ongole crossbred cattle.

MATERIAL AND METHODS
By following completely randomized experimental design, 16 Ongole crossbred cattle aged about 18 months with average initial weight 308.1 ± 46.8 kg were divided into four treatments of basal feed and located in individual stalls. Dietary treatments offered was: Treatment A (100% Napier grass (Pennisetum purpureum), as control), Treatment B (67% grass + 33% rumen contents silage), Treatment C (33% grass + 67% rumen contents silage), and Treatment D (100% rumen contents silage, without grass). Each treatment consisted of four cattle as replication. All treatments were applied to cattle for three months. Commercial concentrate with 13.2% crude protein (CP) and 2.04 Mcal/kg metabolic energy (ME) was also offered in addition to basal feed. The amount and nutrient content of the diets were calculated based on the cattle’s need for maintenance and production (Kearl, 1982).

Silage was made from a mixture of rumen contents with dried cassava pomace (71.9 : 28.1), and added with molasses (4%) and Lactobacillus plantarum (0.01%). Fresh rumen contents were obtained from slaughter houses in Malang, East Java dried cassava pomace from cassava processing factory in District Kandangan, Kediri, East Java molasses from a sugar factory in Kebun Agung, Malang, East Java Lactobacillus plantarum from the University Centre of Universitas Gadjah Mada, Yogyakarta. Silage fed to cattle after finishing the ensilage process for three weeks. The research was conducted at Indonesian Beef Cattle Research Station in Grati, Pasuruan, East Java, Indonesia. Chemical composition was analyzed at Laboratory of Feed Technology, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia.

Chemical composition analysis of feed ingredients used as fed was done on Napier grass, rumen contents silage, and commercial concentrates. The variables measured were feed consumption (feed intake, FI), average daily gain (ADG), feed conversion, and carcass percentage.
RESULTS AND DISCUSSION

Chemical composition of feed

The proximate analysis of feed ingredients (dry matter/DM, CP, ether extract/EE, crude fiber/CF, ash, and nitrogen free extract/NFE) and total digestible nutrients (TDN) are listed in Table 1.

The CP and CF contents of Napier grass were relatively low. According Utomo (2012), CP content of Napier grass at 60 day-old is about 8.3% with CF content about 33.5% and TDN about 50%. Although the CP and CF contents of Napier grass was lower than that of rumens contents silage, the TDN content of rumens contents silage was greater than that of Napier grass. This may happen due to dried cassava pomace and molasses were added in the ensilage process of rumen contents. Crude protein, CF, and NFE contents of dried cassava pomace were 0.90, 16.5, and 60.5%, while molasses were 3.40, 18.1, and 54.5%, respectively (Isnandar et al., 2010). Total digestible nutrients of commercial concentrate was low due to its determination using a regression formula of Harris et al. (1972) cit. Utomo (2012), which is actually fit more for single feed.

Feed intake, weight gain, feed conversion, and carcass percentage

The data of FI, ADG, feed conversion, and carcass percentage of Ongole cattle crossbred were fed dietary treatments are listed in Table 2.

The results showed a declining trend of FI as the increasing of rumen contents silage used in the diet (P<0.05). Interestingly, although the FI showed a decreasing trend, the ADG of cattle fed diets contain rumen contents silage were greater (P<0.05) than those with control diet. This data imply that using rumen contents silage up to 100% (Treatment D) as substitution for Napier grass positively affect the cattle performance, especially the ADG. Furthermore, substitute Napier grass with rumen contents silage (Treatment D) resulted in the best feed conversion (8.09 Table 2). Previous researchers reported that feed conversion Ongole crossbred cattle was 11.8 (Nusi et al., 2011) and 22.6 (Carfalho et al., 2010). The feed conversion of treatment D in this study was much lower compared to that of previous researchers. Since feed conversion depends on the quality of feed was given, this may imply that rumen contents silage can be categorized as good quality feed.

A noticeable increase of carcass percentage (58.6%) was on Treatment C, which 33% of Napier grass and 67% of rumen contents silage were used as basal diet for the cattle. Carcass percentage in this study was greater than that reported by previous researchers. Nusi et al. (2011), in their research reported that carcass percentage of Ongole crossbred cattle was 51.3%, while Carfalho et al. (2010) found that the carcass percentage was 49.4%. Greater carcass percentage obtained showed a better animal productivity, which is in concomitant with the increase of ADG.

CONCLUSION

The use of rumen contents silage as substitute for forage (Napier grass) up to 100% decreased FI, increased ADG, and resulted in better feed conversion. However, using rumen contents silage up to 67% resulted with the greatest carcass percentage. Thus, it can be concluded that the most optimum use of rumen contents silage is up to 67% in the diet.

IN MEMORIAM

In memoriam to our colleagues Uum Umiasih who participated in this research, but she have been summoned to Allah. Hopefully her sins are forgiven and got the best place with Allah, Aamiin.

KEYWORD: Rumen contents silage, Ongole steers, Average daily gain, Carcass percentage

Table 1. Chemical composition of feed ingredients used for feed (% DM)

<table>
<thead>
<tr>
<th>Feed ingredient</th>
<th>DM</th>
<th>CP</th>
<th>EE</th>
<th>CF</th>
<th>Ash</th>
<th>NFE</th>
<th>TDN1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Napier grass</td>
<td>28.8</td>
<td>6.70</td>
<td>2.43</td>
<td>24.5</td>
<td>13.6</td>
<td>53.1</td>
<td>59.6</td>
</tr>
<tr>
<td>Rumen contents silage</td>
<td>38.0</td>
<td>4.63</td>
<td>2.13</td>
<td>13.9</td>
<td>7.05</td>
<td>72.3</td>
<td>70.4</td>
</tr>
<tr>
<td>Commercial concentrate</td>
<td>84.3</td>
<td>15.7</td>
<td>3.03</td>
<td>15.5</td>
<td>12.6</td>
<td>52.7</td>
<td>59.0</td>
</tr>
</tbody>
</table>

Source: Laboratory of Feed Technology, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia.

1 Calculated based on formula in Harris et al. (1972) cit. Utomo (2012).
Table 2. Feed intake, average daily gain, feed conversion, and carcass percentage of Ongole crossbred cattle were fed diet treatments based on rumen contents silage

<table>
<thead>
<tr>
<th>Items</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed intake (kg)</td>
<td>12.3± 2.42</td>
<td>11.0\textsuperscript{ab} ± 2.14</td>
<td>10.3\textsuperscript{ab} ± 1.57</td>
<td>8.54\textsuperscript{b} ± 0.42</td>
</tr>
<tr>
<td>ADG (kg)</td>
<td>0.72± 0.09</td>
<td>1.09\textsuperscript{b} ± 0.21</td>
<td>1.10\textsuperscript{b} ± 0.39</td>
<td>1.09\textsuperscript{b} ± 0.25</td>
</tr>
<tr>
<td>Feed conversion</td>
<td>17.5\textsuperscript{a} ± 5.14</td>
<td>10.9\textsuperscript{ab} ± 1.65</td>
<td>9.94\textsuperscript{ab} ± 2.42</td>
<td>8.09\textsuperscript{b} ± 1.40</td>
</tr>
<tr>
<td>Carcass percentage (%)</td>
<td>53.3\textsuperscript{a} ± 2.76</td>
<td>56.0\textsuperscript{ab} ± 0.75</td>
<td>58.6\textsuperscript{b} ± 1.48</td>
<td>56.1\textsuperscript{b} ± 3.08</td>
</tr>
</tbody>
</table>

\textsuperscript{a,b} Means with different superscripts in the same row are significantly different (P<0.05).

A = 100\% Napier grass, B = 67\% Napier grass + 33\% rumen contents silage, C = 33\% Napier grass + 67\% rumen contents silage, D = 100\% rumen contents silage.

REFERENCE


