Utilization of local feed to support new entrepreneur in poultry business

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Abstract. Nowadays, Indonesian poultry business dominated by big enterprises like Charoen Phokpand Indonesia, Japfa Comfeed, Gold Coin etc. The enterprises depend on imported feedstuffs, so the feed price is very volatile because influenced by international trade and dollar value change. The condition cause the new enterprises difficult to survive, so that it will be reasonable for them to utilize local feed. The objectives of the research were utilization of local feedstuffs in ration formulation in order to minimize feed cost and ensure availability of feed continuously.

Keywords – feed, price/cost, entrepreneur, poultry business.

1. Introduction
Nowadays the poultry business in Indonesia is dominated by large companies such as Charoen Phokpand Indonesia, Japfa Comfeed, Gold Coin and others. The companies producing ration use feed stuffs mostly imported producks. This causes the price of ration became unstable and tends to rise in accordance with the exchange rate of the dollar against the rupiah. The condition causes a small scale enterprises especially that managed by new entrepereneurs being difficult to grow. On the other hand the local feed ingredients available in sufficient quantities to support ventures with small scales, but how is the optimal use of each feed stuff has not been studied in real. This research aims to formulate rations using local feed materials for three types of poultry i.e. broiler, local chicken and duck.

2. Materials and methods
The research material was used to formulate rations are corn, rice bran, coconut cake, soy beans, dried fish, bone meal and topmix. The rations were formulated for broiler, local chicken and duck in starter period. The data used were price, nutrient content, limitations, as well as nutritional needs each of poultry. The feed ingredient price data obtained through the survey to the source of raw materials in the city of Padang. The data content of nutrition and nutritional needs as well as limitations on the use of the feed materials obtained by the study of literature. Ration formulation is done with the algorithm of fuzzy linear programming using Microsoft excel software which comes with solver function. The following mathematical model was applicated to formulate the rations [1].

Minimize \( Z = \sum_{i=1}^{n} \sum_{j=1}^{m} C_{ij} X_{ij} \)

Subject to : \( \sum_{j=1}^{m} a_{ij} X_{ij} \geq \leq \text{or} = L_{ij} \)
Where:
\[ Z = \text{cost of complete ration} \]
\[ n = \text{the number of feedstuffs} \]
\[ C_i = \text{cost of } i^{th} \text{ feedstuff} \]
\[ X_i = \text{Percent of } i^{th} \text{ feedstuff} \]
\[ m = \text{number of constraints} \]
\[ a_{ij} = \text{technical coefficient of } i^{th} \text{ feedstuff } j^{th} \text{ constraint} \]
\[ L_j = j^{th} \text{ constraint limitation} \]

3. Result and discussions

3.1. Identification of Local Feedstuffs

The result of identification of local identification presented on Table 1. On the table it looks that there are 10 kinds of potential feed ingredients used as a constituent of rations. As an energy source is corn and rice bran, while as a source of protein is the coconut cake, soybean and fish meal. On the table was also seen that the soybean in addition to serve as a source of protein, also serves as an energy source because of its high content of ME also. Bone meal, crab shells, limestone and topmix serves as a source of minerals.

3.2. Ration Formula

Ration formulation results for three kinds of poultry kept by new entrepreneurs are presented in Table 2. In the table was presented that the most expensive ration was broiler ration and followed by ducks and local chicken. The price of chicken broiler rations (IDR 4,103/kg) caused by high nutrient needs. The broiler chicken require minimum 22% protein and ME 3000 kcal/kg. Ducks just need protein by 17% and 2800 kcal/kg, so the ration price not too high i.e. IDR 3,470/kg. The cheapest ration was local chicken i.e. IDR3,185/kg because it requires only as many as 16% protein and 2800 kcal/kg of ME. Based on the results of the ration formulation It is evident that the cost of ration closely relate with nutrient content of the ration especially protein and ME.

| No | Feedstuff   | Price (IDR/kg) | ME (Kcal/kg) | Nutrient content (%) |
|----|-------------|----------------|--------------|----------------------|
| 1  | Corn        | 3000           | 3430         | CP 8.7 Fat 3.9 Ca 2  |
|    |             |                |              | P 0.02 Lys 0.3 Meth 0.2 | Trip 0.1 |
| 2  | Rice brand  | 2000           | 1630         | CP 13.5 Fat 13 Ca 12 |
|    |             |                |              | P 0.12 Lys 1.5 Meth 0.8 | Trip 0.1 |
| 3  | Coconut cake| 2600           | 1540         | CP 21 Fat 1.8 Ca 15 |
|    |             |                |              | P 0.2 Lys 0.6 Meth 0.6 | Trip 0.2 |
| 4  | soybean     | 8000           | 3510         | CP 38 Fat 18 Ca 5 |
|    |             |                |              | P 0.25 Lys 0.6 Meth 0.6 | Trip 0.2 |
| 5  | Fish meal   | 5000           | 2970         | CP 50 Fat 8 Ca 1 |
|    |             |                |              | P 5.5 Lys 2.8 Meth 5 | Trip 0.8 |
| 6  | Bone meal   | 4000           |              | CP 24 Fat 12 |
|    |             |                |              | |
| 7  | Crab shells | 4000           | 1870         | CP 31 Fat 2 Ca 11 |
|    |             |                |              | P 15 Lys 1.6 Meth 1.4 | Trip 0.5 |
| 8  | Limestone   | 1000           |              | CP 40 |
|    |             |                |              | |
| 9  | Topmix      | 10000          |              | CP |

On the table was also seen that a large part of energy source were supplied by corn. More half of the ration comes from corn. Other energy sources are soy bean, nevertheless because it was expensive, only the broiler using it, while local chickens and ducks did not use. Protein source was dominated by dried fish and added with coconut cake and rice bran. Soy beans in addition to serve as a source of energy also serves as a source of protein. Other materials such as crab shell, limestone and premix serves as a source of minerals.
Table 2. The results of the feed formulation using local materials for three kinds of poultry.

| No | Feedstuffs     | Broiler Formula (%) | Local Chicken Formula (%) | Duck Formula (%) |
|----|----------------|---------------------|---------------------------|-----------------|
| 1  | Corn           | 51.7                | 57.0                      | 55.3            |
| 2  | Rice Bran      | 2.1                 | 19.9                      | 18.9            |
| 3  | Coconut cake   | 14.5                | 7.7                       | 8.1             |
| 4  | Soy Beans      | 10.1                | 0.0                       | 0.0             |
| 5  | Dried fish     | 20.0                | 12.8                      | 15.3            |
| 6  | Crab shells    | 1.0                 | 1.0                       | 1.0             |
| 7  | Limestone      | 0.0                 | 1.0                       | 1.0             |
| 8  | Premix         | 0.5                 | 0.5                       | 0.5             |
|    | Total          | 100                 | 100                       | 100             |

The price (IDR/kg)

| No | Nutrient Content | Broiler | Local Chicken | Duck |
|----|------------------|---------|----------------|------|
| 1  | ME (Kcal/Kg)     | 3000    | 2800           | 2800 |
| 2  | CP (%)           | 22.0    | 16.0           | 17.0 |
| 3  | Fat (%)          | 6.0     | 6.0            | 6.0  |
| 4  | CF (%)           | 4.3     | 4.9            | 4.8  |
| 5  | Ca (%)           | 1.3     | 1.3            | 1.4  |
| 6  | P (%)            | 0.9     | 0.9            | 0.9  |
| 7  | Lysine (%)       | 1.5     | 1.0            | 1.1  |
| 8  | Methionine (%)   | 0.6     | 0.4            | 0.5  |
| 9  | Tryptophan (%)   | 0.3     | 0.2            | 0.2  |

4. Conclusion

Broiler ration, local chicken and duck can be formulated with feed local. The price of rations were IDR 4,103, 3,185 and 3,470 for broiler rations, local chicken and duck successively.

5. References

[1] Adrizal dan Marimin. 2004. Aplikasi Fuzzy Linear Programming untuk Optimasi Formulasi Ransum Unggas. Jurnal Keteknikan Pertanian 18: 77-85.

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