Native pigs (Moo Lat) production in Lao PDR

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Abstract

Pig raising continues to be an important livelihood activity in Laos based on traditional methods which are increasingly influenced by social and market pressures. More than 80 percents of pig herds are native breeds and belong to smallholders with combine raising systems. From the field survey, the native pigs have been characterized and classified in to four type of breeds by phenotypes. In most cases, the native pigs in Laos were pigs of the short ear, black coat color and potbellied fatty breeds, but have some pigs with large pendulant ears were found in particular pig population. They yield lower performances than exotics, but require lower production inputs and have excellent adaptation traits.

Key words: Lao PDR, native pigs(Moo Lat), potbellied fatty breed, smallholder system

Introduction

The Lao PDR is located in the heart of the Indochina peninsular, in Southeast Asia. Latitude 14 to 23 degrees north and longitude 100 to 108 degrees east. Laos is a landlocked country. It shares a 505 km border with China to the north, 435 km of border with Cambodia to the south, 2,069 km of border with Vietnam to the east, 1,835 km of border with Thailand to the west, and a 236 km border with Myanmar to the northwest. The country stretches 1,700 km from north to south, with an east-west width of over 500 km at its widest, only 140 km at the narrowest point. The Lao PDR covers a total of 236,800 square kilometers (with 5.2 million of population), three-quarters of which is mountainous and plateau.

In the country about 85% of the country’s working population is engaged in agriculture that share about 52% of GDP. Among others, the livestock and fisheries sub-sector shares about 18% of the GDP (MAF, 2005).

The livestock population in 2007, consisted of 1.15 million head of buffalo, 1.5 million of cattle, 2.5 million of pigs (with about 20% of them being exotics), 21.9 million of poultry and 280,000 goats. The smallholder production system dominates in Lao PDR and is characterized by low inputs and low outputs. The traditional livestock management practice is based on free-range grazing of harvested or fallow lands. Breeding is generally uncontrolled, with no or little attempts at genetic improvement.

Pig production is the most significant part of smallholder livestock management in Laos and becoming increasingly important for food security, demand for pig meat is increasing and supply of locally produced pig meat has not been able to meet this demand. Consequently importation of pre-fattened market ready pigs from neighbouring country is increasing. In 2007 pork was second consumed meat, with an estimated 11.55 kg eaten per person (DLF, 2008). Percapita pig density is highest in the northern mountainous region and in the southern region in the mountainous areas along the border with Vietnam. Among the various ethnic groups pig ownership is
highest among the Hmong people with 73% of households raising pigs, which compares to 64% for Khmu people and 38% for Lao lounm people (Agricultural census 2000). At the village level, improved efficiency of native pig production throughout the country is significant means of livelihood security, reducing poverty and gene pool conservation.

Materials and methods

Nation-wide indigenous pig survey was carried out in 1996, 35 districts were selected to implement the survey. Ten villages were selected for each district. Seven households with more than 3 adult pigs of ownership were interviewed in each village. Interviews by using questionnaire form and visual evaluation were the main tools for data collection. The interview covers many areas of interest relevant to pig production, management, breed, feed and feeding system, production and reproduction performance. As the data were collected, the provincial livestock officer who is supervising the survey at provincial level will sort out the data and report to the national coordinator to compile the data by using Access program.

Criteria taken into consideration to identify the different types of indigenous pig, were the body’s length, the circumference of the girth, the height, the colour of the skin, the direction of the ears and other. It was classified into 4 types as a result.

Results and discussion

Pig breeds

It was classified into 4 types as belows

First type (Local names: Moo chid, Moo Markadon, Moo Boua)

1. Locations and morphological characters

The first type is scattered in nation-wide of the country. The pig is relatively small size compared to other types existing in the country. There are 75-92 cm, 72-85 cm and 46-54 cm of body’s length, circumference of the girth, and the height, respectively. Their ears are small, short and direction. The coat color mainly are black and white legs.

2. Reproductive performances

Age at first estrus is between 182-397 days (8 months) with 21-31 kg of body weight. The maturity weight of sows is around 42-48 kg. Age at first farrowing is 360 days. There are 1.5 litters per year with 7-8 piglets per litter. Normal weaning date is 3 months and 7.8 kg on average of weaning weight.

The maturity of male has lower body weight than female due to lack of mating management. Average body weight is 20.5 kg with 172-200 days old. The maximum body weight of boars is between 18-30 kg.
**Second type** (Local names: Moo Lat)

1. **Locations and Morphological characters**

   The second type is mostly found in some upland areas (such as Louangprabang, Oudomxay, Xaysomboun) and also found in some lowland provinces such Saravane and Savannakhet provinces. This type is quite bigger than first one. The legs and infront of face are white color, short and direct ears and strait face. There are 85-100 cm, 84-102 cm and 51-70 cm of body’s length, circumference of the girth and the height, respectively.

2. **Reproductive performances**

   Age at first estrus is between 189-586 days (356 days) with 39 kg of body weight. The maturity weight of sows is around 47-61 kg. Age at first farrowing is 360 days. There are 1.5-1.8 litters per year depends on management systems and 7-8 piglets per litter. Normal weaning date is 60-90 days with 9.5 kg on average of weaning weight.

   The maturity of male has lower body weight than female due to lack of mating management. Average body weight is 25 kg. The maximum body weight of boars is between 30-50 kg.

**Thirth type** (Local names: Moo Nonghad or Moo Hmong)

1. **Locations and Morphological characters**

   The third type is specifically found in Nonghad district, Xienkhouang province. So the name of the pig is called “Nonghad pig”. The pig is quite big with the body length 100-105 cm, the girth circumference 115-130 cm and the height 55-76 cm. The colour is mostly black and pink in abdominal region. The face is short and bend, medium size and direct of ears.
2. Reproductive performances

Age at first estrus is between 150-180 days (5-6 months) with 30-40 kg of body weight. The maturity weight of sows is around 65-85 kg. Age at first farrowing is between 10-11 months. There are 1.5-1.8 litters per year with 7-10 piglets per litter. Normal weaning date is 2-3 months and 8 kg on average of weaning weight. The maximum body weight of boars is between 60-80 kg.

![Picture 3: Third type of Lao native pig](image)

Fourth type ((Local name: Moo Deng or Moo Berk)

1. Locations and Morphological characters

The fourth type is easier to identify because of its characteristics and colour of the skin. This kind of pig is seemingly bigger than any others existing in Lao PDR. This pig is the well-adopted and stabilized cross-breed pig (Berkshire x local pig). This type found only in southern part of Lao, particularly in Mounlapamok and Khong districts, Champasack province. The face is short and bend, large size and dropping of ears. There are 88-120 cm, 84-116 cm and 60-70 cm of body’s length, circumference of the girth and the height, respectively.

2. Reproductive performances

The maturity weight of sows is around 65-90 kg. Age at first farrowing is between 11-12 months. There are 1.5-1.8 litters per year with 7-10 piglets per litter. Normal weaning date is 2-3 months and 8.5 kg on average of weaning weight. The maximum body weight of boars is similar to sows.

![Picture 4: Fourth type of Lao native pig](image)

According to the phenotypes, the four types of pigs could be four different breeds, it is preliminary classification, more research with advance technique are required, such as DNA analysis.
Raising systems

According to survey, there are many ways farmers manage and feed pigs. These include:

1. Extensive system: free range scavenging all of time and supplementing some feed in the morning and evening.
2. Semi extensive system: free range scavenging during the day with supplementary feeding and confinement in enclosure during night time.
3. Semi intensive: Confinement in and enclosure with simple housing and feed provided.
4. Intensive system: raising in a permanent pens and feed provided.

There are many combinations of these basic management systems and tradition of ethnic groups.

Growth performances and carcass compositions

According to unpublished surveys, the average daily gain (ADG) of Moolat pigs, a local breed of pigs used extensively in the Lao PDR uplands, does not exceed 100g. The pigs are fed with diets mostly based on rice bran, maize and cassava roots with some additional green plant material, which are not available the whole year. In the same system, farmers supplemented with Stylosanthes guianensis (Forage legume) could be increased average daily gain (ADG) from 107 g/day to 207 g/day (Phonepaseuth and Werner, 2006). However, if fed a nutrient dense diet to Moo Lat pigs can be grown up more than 500 g per day and different levels of fat contents as show in table 1 and 2.

Table 1: Growth performance of indigenous pigs fed restricted levels of commercial diets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>T1 100%</th>
<th>T2 90%</th>
<th>T3 80%</th>
<th>T4 70%</th>
<th>T5 60%</th>
<th>LSD (P=0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of animal</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>3.14</td>
</tr>
<tr>
<td>Initial weight (kg)</td>
<td>21.3</td>
<td>20.8</td>
<td>19.7</td>
<td>18.7</td>
<td>21.1</td>
<td>1.38</td>
</tr>
<tr>
<td>Final weight (kg)</td>
<td>61.7</td>
<td>60.8</td>
<td>61.3</td>
<td>61.2</td>
<td>61.9</td>
<td>1.43</td>
</tr>
<tr>
<td>Total weight gain (kg)</td>
<td>41.4</td>
<td>40.5</td>
<td>41.0</td>
<td>40.8</td>
<td>41.6</td>
<td>8.70</td>
</tr>
<tr>
<td>Days to final weight (day)</td>
<td>77c</td>
<td>76c</td>
<td>80c</td>
<td>94b</td>
<td>122a</td>
<td>57.1</td>
</tr>
<tr>
<td>ADG (g)</td>
<td>558a</td>
<td>542a</td>
<td>523a</td>
<td>446b</td>
<td>346c</td>
<td>0.27</td>
</tr>
<tr>
<td>FCR</td>
<td>3.61a</td>
<td>3.39ab</td>
<td>3.23b</td>
<td>3.21b</td>
<td>3.44ab</td>
<td></td>
</tr>
</tbody>
</table>

The growth rate of pigs was fed restricted or ad libitum with a commercial diet was actually higher than previous study (Phonepaseut 2006 unpublished field survey data (100g/day); Ratchadawan et al 2006 used vegetable, stylo leaves and concentrate for feeding local pigs in Thailand (range of 113g to 232 g/day); Sopha et al 2007 was fed Moolat pigs by cassava leaf silage (range of 155g to 193 g/day)). Keoboualaphet et al (2003) found that the growth rate of native pigs grown 154g-320g/day when supplemented by Stylo leaves.
Table 2. Carcass composition

<table>
<thead>
<tr>
<th>Items</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>LSD (P=0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of animals</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Pre-slaughter weight</td>
<td>62.0</td>
<td>61.7</td>
<td>61.1</td>
<td>62.0</td>
<td>62.0</td>
<td>1.45</td>
</tr>
<tr>
<td>(kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back fat at P2 (cm)</td>
<td>3.4</td>
<td>3.5</td>
<td>3.3</td>
<td>3.4</td>
<td>3.1</td>
<td>5.01</td>
</tr>
<tr>
<td>Carcass weight (kg)</td>
<td>42.7</td>
<td>42.7</td>
<td>41.8</td>
<td>42.1</td>
<td>42.3</td>
<td>1.72</td>
</tr>
<tr>
<td>Total fat (kg)</td>
<td>25.3a</td>
<td>24.2ab</td>
<td>23.5ab</td>
<td>22.3bc</td>
<td>20.3c</td>
<td>2.59</td>
</tr>
<tr>
<td>Fat %</td>
<td>59a</td>
<td>57a</td>
<td>56a</td>
<td>53ab</td>
<td>48b</td>
<td>6.2</td>
</tr>
<tr>
<td>Total lean meat (kg)</td>
<td>14.8b</td>
<td>14.5b</td>
<td>15.2b</td>
<td>15.0b</td>
<td>16.9a</td>
<td>1.16</td>
</tr>
<tr>
<td>Lean %</td>
<td>35bc</td>
<td>34c</td>
<td>36b</td>
<td>36b</td>
<td>40a</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Source: Soukanh et al. (2008)

Thirty pigs were slaughtered at different time when they reached to 60 kg. The carcass weight of all treatments was similar 42 kg on average. The animals in T1 which is accessed to feed ad libitum put more fat than the other groups, but there was no significant different among T1, T2 and T3 with the total fat about 25.3 kg; 24.2 kg and 23.5 kg, respectively. In contrast, the amount of lean was higher in animals from T5 (16.9 kg or 40 %) which had restrict diet of 60% of total daily intake. Where the other groups were lower which range from 14.5 -15.2 kg or 34-36 % of carcass weight.

Constraint of native pigs production at village level

The main constraints of village pig production are:
- Lack of breeding management (free ranging, could not control mating system)
- Disease epidemics (classical swine fever).
- Lack of good quality of feed (poor growth rates)
- Lack of suitable management (high piglet mortality)

Conclusion

- The due classification of native pig is not completed. It is preliminary classification according to their morphologies, more research with advance technique are required, such as DNA analysis.
- The potential of performance (ADG) of native lao pig (Moo Lat) when fed high quality commercial pig diet in which energy and protein are excess to requirements can be grown more than 500 g/day. In this case showed that low growth rate observed on-farm is due to feed restriction rather than to a low growth potential of the Moolat pigs.
- In which case of they were fed a nutrient dense diet their feed intake should be restricted to avoid excess accumulation of fat in the body, which is expensive in term of energy and feeding costs. However, we need to give knowledge (nutrient strategies) to farmers for ensure optimum performance.
- Raising awareness to farmers to maintain and better use of native pig’s genetic resources for more efficient and sustainable food production and long-term food security.
- Changing extensive production system to semi or intensive system by using an appropriate technology to increased yield and safety of products.

References


