



Seminar on Boar Semen Application for Pork Quality Improvement

Pig Production & Pork Quality Improvement in Lao PDR

By

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Outline of presentation

1. Introduction
2. Status of pig production.
3. Semen processing and utilization for pork quality improvement.
4. Conclusion.

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1.Introduction

1.Lao PDR is a land locked country in the hearth of Indochinese peninsular of main land Southeast Asia bordered by Myanmar and China to the northwest, Vietnam to the East, Cambodia to the Southwest and Thailand to the west and Southwest. Population is 5.6 million with 236.800 Square Km of areas.

2. Potential factors to develop livestock production such as:

- Climatologically
- Surface area
- Agricultural labor
- Animal breed
- Animal feed
- Market
- Government policy

1.Introduction cont'

3. The agricultural sector contributes 24.1 % of the gross domestic product (GDP) including 6.5 % by the livestock and fisheries sub-sector.
4. livestock population consisted of 1.15 million buffalo, 1.76 million cattle, 32.40 million poultry, 0.48 million goats and 3.12 million pigs (with about 518.400 heads or 16.5 % of them being exotics breed or in Lao terms 'modern, intensive' breeds).
5. The pork was the second most consumed meat with estimated 12 kg per capita while meat consumption per capita per year was 55 kg (MAF,2015).

2. Status of pig production

- Pig production is the most significant part of smallholder livestock management in Laos and becomes increasingly important for food supply.
- The density of pig population is highest in the northern (40%), southern mountainous regions (33%) and central region (27%).
- The social demand for pork is rapidly growing; the small scale and commercial farms pig production cannot satisfy it.
- Consequently, the import of pre fattened pigs for slaughter from neighbouring countries is increasing about 124,000 heads per year (2015).

2. Status of pig production cont'

- Number of small-medium pig farms are decreased but number of pigs increase owing to could not competitive.

Animal species	2013		2014		2015	
	Farm number	Animal number	Farm number	Animal number	Farm number	Animal number
Pig	762	245,148	668	293,000	641	518,433
Cattle	287	33,035	195	28,000	149	37,668
Layer	248	1,42,000	253	1,370,000	248	1,380,000
Broiler	88	517,300	89	335,000	96	1,090,000

2. Status of pig production cont'

- Typically, farmers raised pigs using in three main production systems, namely:
- **Free-scavenging system (Extensive system):** free range scavenging all the year round, and supplementing small amount of additional feedstuff for their pigs. Farmers practicing the free-scavenging system kept pigs mostly for piglet production.
 - **Semi-scavenging system (Semi-extensive system):** The semi-scavenging system was used for both piglet production and fattening.
 - **Penning system:** Was found to be the most common pig production system mainly in the areas closer to the district center. Pigs in penning system have used both indigenous and crossbred, and were fed both traditional feeds, such as rice bran, maize, broken rice, cassava, completed feed and concentrates.

2. Status of pig production cont'

❖ Pig breeds

1. Indigenous breed (fatty pig)
2. Exotic breed (Large white, Landrace and Duroc)
3. Improved breed (Black pig)

2.Status of pig production cont'

- Nation-wide indigenous pig survey was performed from 1996 to 2004. Based on the phenotypic criteria, pigs were classified into four types.



Type 1



Type 2.

Its body length, circumference of the girth and the height is 75-92 cm, 72-85 cm and 46-54 cm, respectively. The weight of mature sows is about 42-48 kg. There are 1.5 litters per year with 7-8 piglets per litter. Mature males have lower body weight than females, i.e. the average body weight is 20.5 kg at the age of 170-200 days, and the maximum body weight of boars is between 18-30 kg.

Body length is 85-100 cm; the girth and height are 84-102 cm and 51-70 cm, respectively. The age of the first oestrus is between 189-586 days with 39 kg of body weight. The weight of mature sows is about 47-61 kg. Depending on management systems, sows have 1.5-1.8 litters per year and 7-8 piglets per litter.

2.Status of pig production cont'



Type 3



Type 4.

It is quite big with body length of 100-105 cm, girth circumference of 115-130 cm and height of 55-76 cm. It is 2-3 months and the weaning weight is 8 kg on average. The maximum body weight of boars is between 60-80 kg.

Body length, circumference of the girth and the height are 88-120 cm, 84-116 cm and 60-70 cm, respectively. The weight of mature sows is around 65-90 kg, and the first farrowing age is between 330-360 days. They have 1.5-1.8 litters per year with 7-10 piglets per litter. Piglets are normally weaned at the age of 2-3 months and a weight of 8.5 kg.

2.Status of pig production cont'

Research on carcass composition of native pig

Parameters	Restriction of feeding level					LSD
	100	90	80	70	60	
Number of animal (Head)	6	6	6	6	6	
Live weight (Pre slaughter)	62.0	61.7	61.1	62.0	62.0	1.45
Carcass weight, kg	42.7	42.7	41.8	42.1	42.3	1.72
Back fat thickness at P2 (cm)	3.4	3.5	3.3	3.4	3.1	5.01
Total fat contents, (kg)	25.3 ^a	24.2 ^{ab}	23.5 ^{ab}	22.3 ^{bc}	20.3 ^c	2.59
Percent of fat, %	59 ^a	57 ^a	56 ^a	53 ^b	48 ^b	6.2
Total lean meat, kg	14.8 ^a	14.5 ^a	15.2 ^a	15.0 ^a	16.9 ^b	1.16
Percent of lean meat, %	35 ^a	34 ^b	36 ^a	36 ^a	40 ^c	2.6

Suggestion : Quantity & Quality of feed should be optimum to avoid fat accumulation.

2.Status of pig production cont'

2. Imported breed



Large white

Landrace

Duroc

Since 1980 Lao government had introduced 120 sows and 10 boars of exotic breed from Thailand namely: Large white, Landrace and Duroc. Up to now the total number of sow reach to 25,000 heads in nation-wide (CP, Bet agro, Lao farm...)

2. Status of pig production cont'

3. Improved breed (Black pig)



Since 2012 Livestock Research Center (NAFRI) has developed cross bred pig (NTxLRxDR) focused on improvement of litter size, growth rate, and meat quality for smallholder farmers who use local feed resources. An improved variety has higher ADG (> 500 g/day) and litter size (> 8 piglets) and less fat content.

2. Status of pig production cont'

Pork production & consumption in country

Pig breed	Number of pig (head) 2015	Pork production Tons	Percentage	Pork need Tons
Native pig	2,601,600	43,000	66%	
Exotic pig	518,400	22,000	34%	
Total	3,120,000	65,000	100	80,000-90,000



3. Semen processing and utilization for pork quality improvement.

- Production systems were determined pig mating systems in Laos. The extensive (free range sys.) and semi-intensive mostly are used natural insemination (NI) method. Presently, only large or medium commercial pig farms (Intensive sys.) or number of sows >100 heads are practiced in artificial insemination (AI) method.
- Most of commercial pig farms are used fresh or liquid preservation semen which process themselves.
- Frozen semen import is not found anywhere.

3. Semen processing and utilization for pork quality improvement.

- Relative research on semen processing: **Effect of different extenders on native pig semen preservation.**
- **Objective:** Using AI for preservation and development of the native swine population.
- **Materials:** 3 native boars and 3 types of extender (BTS, RMA & Acromax) were used in this experiment.
- **Result:**
 - There was no significant difference in the motility and dead cell rate between extenders during storage.
 - However, after day 2 sperm parameters tended to be better in MRA extender.
 - On day 3 more than 60% motile cells were observed only in MRA, and this declined to 45% on day 5.
 - It was evident that all investigated extenders could be used to store semen for insemination within two days after collection, and MRA can be used for storage of semen for 3-4 days.

Conclusion

❖ Limitations

- Pork does not meet domestic consumption demand (quantity & quality) due to the transition from subsistence farming system to intensive commercial production. For this reason mainly we still import from neighboring countries.
- Lack of cooperation between government and private sector (PPP) in terms of policy development for promoting pig production comprehensively.
- Limited source for supplying good quality breed especially for parent stock replacement, entrepreneurs have to import.
- There is no any semen center for providing high genetic value.
- Limited fund and research facilities for doing this activity.

Conclusion

❖ Opportunities

- Laos located in the center of region with high density of citizens who have demand on pork increasingly. It is expected that the market and demand of pig product in the country and neighboring countries continues to rise
- Liberalization of trade, a member of WTO and open to the Asian Economy Committee (AEC) is a good opportunity for Lao PDR to open the production and market of live pigs/pork to the region.
- Lao PDR has the facility in adaptation of techniques and technology on farm management from neighboring countries as well as regional which have the advanced lesson, knowledge and experience.
- The Lao government strongly support to improve quality of implementing Sanitary and Phytosanitary measures this will upgrade quality of Lao products to the international markets.

