CURRENT STATUS OF LIVESTOCK REPRODUCTION AND THE USE OF ADVANCED REPRODUCTIVE BIOTECHNOLOGIES IN CAMBODIA

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ABSTRACT

Cambodia is known as an agricultural country in which the agriculture contributed 34% of National GDP in 2013. Livestock production is one of main agricultural activities which are defined as diversified rural farming system. Though, we have a large, medium and small scale of the farming, the small has varieties of chicken, duck, pig, cattle, and buffalo productions, and less numbers of goat and sheep productions. Livestock production is facing some challenges such as low-yield breed, poor quality and quantity of locally available feeds and high-cost of commercial feeds, inadequate research, limitation of human resources, and lack of in-hand policy to improve both small scale and industrial aspect for development of production and marketing. As Cambodia is a hot and humid country, it is not in favor for diary production which needs large-scale investment. In the meantime, only 60 dairy cows are being raised under the management of a local association near by the Phnom Penh city. Semen production and artificial insemination are preferable use in commercial pig farms, but their application on cattle must be encouraged to improve both commercial and smallholder farms. Moreover, there has been no reproductive biotechnology existing in the country and it’s important to have human resources and governmental policy to have it for livestock production and national economic improvement.

INTRODUCTION

Overview of Livestock Production in Cambodia

Cambodia population is 14 million; majority of population lives in rural area. Agricultural contribute to National GDP was 34 % as of 2013. Within Agriculture GDP, livestock and poultry contribute 14 %. Livestock production is defined as diversified rural farming system in which farmers keep them for selling, breeding and stock (MAFF, 2013). As 85% of our populations are farmers, and based on the research done by one local non-government organization (CelAgri, 2013) the number of smallholders who have raised the livestock and the average number of livestock in family farms are as follows;

- 89.9% keep in range of 5-23 chickens
- 66.9% keep in range of 1-5 cattle
- 46.1% keep in range of 1-5 pigs,
- 23.5% keep 1-40 in range of ducks, and
- 15% keep 1-3 in range of buffalos
- Cattle is the second most important animals in smallholder farms

Livestock population in Cambodia is shown in Table 1. We have 3.4 million cattle and 0.62 million buffalos.

<table>
<thead>
<tr>
<th>Species</th>
<th>Population (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>3.4</td>
</tr>
<tr>
<td>Buffalo</td>
<td>0.62</td>
</tr>
<tr>
<td>Pig</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Table 1
The constraints of livestock production and government actions to be taken to solve them are shown in Table 2. The improvement on livestock animals’ genetics for high production performance is essential for effective production of livestock products.

Table 2

<table>
<thead>
<tr>
<th>Livestock Raising constraint</th>
<th>Government action to be taken</th>
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<tbody>
<tr>
<td>Limited technique of livestock raising</td>
<td>Urgent change from subsistent livestock raising to one with appropriate technique and commercialization</td>
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<tr>
<td>Poor quality and quantity of livestock feed</td>
<td>Promote the forages plantation, feed processing based on local resources (agricultural product residues)</td>
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<tr>
<td>Livestock breed: low yield</td>
<td>Selection of breed which meet market demand (high productivity and resistance to environment and diseases)</td>
</tr>
<tr>
<td>Limited Research capacity for livestock genetic perform to improve production and health</td>
<td>Enhance research capacities on improving livestock genetics, breeds, reproduction and feeding Establish laboratory for producing vaccine</td>
</tr>
<tr>
<td>No policy/strategies for developing industry in place, especially, cattle</td>
<td>Develop policy/strategies/roadmap for improvement of livestock industry</td>
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</tbody>
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DAIRY BREEDS PRODUCTION

Cambodia is hot and humid country, and the dried season is slightly longer than that of rainy season. Normally, dried season is from November to April and its temperature is 32-37°C. That higher temperature is not favor of dairy production as it needs to be invested in large-scale enterprise. There is only one association of Dairy Breeds in the country. First, it was funded and supported by European aids, and now it becomes an association governed by the farmer or farmer association, nearby Phnom Penh city. The breed is a combination of imported bull semen of Jersey, Hariana and Brahman with local cows. Totally both local and hybrid dairy cows are around 60 heads, and milk yield is in range from 6-8 liters per cow/day.

SEmen Production and Artificial Insemination

Previously, Hariana and Brahman were imported to Cambodia since 1950 (Maclean, 1998), and widely spread in 1980 through the artificial insemination technique (Maclean, 1998 & Soun, 2003). Nowadays, however, semen production and artificial insemination are rarely to be applied in ruminant, and it becomes a preferable practice in commercial pig farms. The animal breeds are increasingly improved according to the national policy and strategy of animal health and production, and they are promoted by import of genetic materials, selections of local breeds with high productivity in order to extend animal breeds to farmers and private farmers within countryside as well. According to MAFF (2013), main animal breeds in Cambodia are as follows;

- Kampaing Saen and Bramahn in Phnom Tamao breeding station.
- Imported cattle semen of Simbra and Santa for artificial insemination in some provinces that bred 556 heads of local cows and produced 425 calves.
- Other private sectors have actively enhanced these activities as well.

EMBRYO TRANSFER AND OTHER REPRODUCTIVE BIOTECHNOLOGY

Cambodia is developing country and the reproductive biotechnologies such as embryo transfer and cloning have never existed. We don’t have national policy, human resources and proper equipment and environment needed for us to be able to use them to improve productivity of livestock.
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