STATUS OF LIVESTOCK REPRODUCTION AND THE USE OF ADVANCED REPRODUCTIVE BIOTECHNOLOGIES IN THE PHILIPPINES

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ABSTRACT

Philippines registered an economic growth of 6.3% with 10% of the 2013 GDP being contributed by the agri-fisheries industry. Having a diverse agricultural industry, it continues to employ one third of the country’s total labor force. Being frequently visited by typhoons the country’s agri-industry faces several losses in both crop and livestock sectors. As a tropical country, the climate does not favor the dairy industry. With the native dairy animals producing an average of 0.5–2 L/day, the industry imports almost 99% of the dairy products in the market. With low milk output, collective efforts on improving the animal genetics to increase dairy production are being conducted.

Artificial Insemination (AI) recognized as one of the major techniques for livestock development is the most widely used biotechnology in the country. In 1982, the Philippine Carabao Research and Development Center (PCRDC) with the aid of UNDP (United Nations Development Programme)/FAO (Food and Agriculture Organization) initiated the Crossbreeding Program in Water Buffaloes through AI, and the program was intensified by the Philippine Carabao Center (PCC) in 1997 resulted in production of thousands of crossbred calves. Another biotechnology that is still developing in the country is the Embryo Transfer (ET). During the past decade PCC has put an effort on improving the use of ET techniques for the production of several numbers of calves from both fresh and vitrified embryos. Reproductive biotechnology such as artificial insemination (AI) and embryo transfer (ET) has become a powerful tool in improvement of genetics and production of livestock animals. In Indonesia, as one of developing countries, faces a challenge to increase the productivity of livestock animals. However, success rate of this technology varies among studies and areas. Although ET as the second generation of reproductive biotechnology has also been introduced and ET station was established, more ET stations are needed to produce more embryos. Improvement of conception rate after AI and ET is important to increase livestock production in Indonesia and finally to meet the demand of the people.

Keywords: Reproductive biotechnology, artificial insemination, embryo transfer

INTRODUCTION

Overview of the Philippine Livestock sector

The Philippines is an agricultural country with an economic growth rate of 6.3% with 10% of the 2013 GDP being contributed by the agri-fisheries industry. Despite the calamities of 2013 the agri-industry output grew by 1.2%. The livestock sector, a major sector of the industry, contributed 16.2% of the industry’s total output for 2013 posting a 1.8% growth in production. With a diversified livestock sector, most of the animal populations of the country are held in smallholder farms or backyard raisers (Table 1).

MILKING BREEDS AND MILK INDUSTRY

The Philippines being a tropical country, the climate does not favor the dairy production. Also the native breeds of the country produce low volume of milk, for this reason the importation of dairy produce is high. To compensate for the low milk production the country has imported several dairy breeds that can withstand the
country’s climate. With the importation of these breeds and several crossbreeding program, the country’s milk production was reported to increase 5.5% for 2013 and has been steadily increasing.

THE PHILIPPINE LIVESTOCK BIOTECHNOLOGY

Artificial Insemination (AI)

AI recognized as one of the major techniques for livestock development as the most commonly used biotechnology in the country. The technique has been used since the establishment of the National Artificial Breeding Center (NABC) in 1965. As a part of the continuing efforts to improve the genetic value of our livestock animals, the Philippine Department of Agriculture (DA) harmonized the AI efforts of the national agencies through the Unified National Artificial Insemination Program (UNAIP). Started in 2001, UNAIP provides better opportunities for livestock farming communities to use AI by enhancing their competitiveness through an institutionalized AI delivery system at the village level.

In 1982, the Philippine Carabao Research and Development Center (PCRDC) with the aid of UNDP/FAO initiated the Crossbreeding Program in Water Buffaloes through AI. Having their own bulls of high genetic value, the program was intensified by the Philippine Carabao Center (PCC) in 1997 resulting in production of thousands of crossbred calves. In 2006, PCC launched a nationwide project dubbed as “Expanding the Reach of AI Program for the Acceleration of Dairy Herd Build-Up” which aims to hasten the expansion of the country’s dairy herd through the Training of Village Base AI technicians (VBAIT) as a part of privatization of AI services.

In 2013 alone, a total of 71,273 AI services were provided by 932 AI technicians in 53,455 female carabaos throughout the country which produced 13,107 calves. Currently, PCC is putting efforts on enhancing the AI efficiency as a part of the national GIP programs for buffaloes.

Embryo Transfer (ET) and Related Biotechnologies

During the past decade PCC has put an effort on developing and improving ET technique as another instrument for livestock genetic improvement. These efforts produced several numbers of calves from both fresh and vitrified embryos in villages and institutional herds.

Mandated as the country’s lead entity in livestock biotechnology research and development, PCC is still continuing its efforts on improving and optimizing reproductive biotechnologies such as In Vitro Embryo Production, Ovum Pick-Up, and Multiple Ovulation Embryo Transfer to ameliorate the productivity of our livestock species.

Table 1. Philippine livestock population

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Backyard (percent)</th>
<th>Commercial (percent)</th>
<th>Total (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swine</td>
<td>65</td>
<td>35</td>
<td>11.80</td>
</tr>
<tr>
<td>Caprine</td>
<td>98</td>
<td>2</td>
<td>3.690</td>
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<tr>
<td>Bovine</td>
<td>93</td>
<td>7</td>
<td>2.504</td>
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<tr>
<td>Buffalo</td>
<td>99.5</td>
<td>0.5</td>
<td>2.84</td>
</tr>
</tbody>
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