

BIOTECHNOLOGY FOR NATIONAL LIVESTOCK PRODUCTION: PRESENT AND CHANCE IN THE FUTURE

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INTRODUCTION

Government program to run public service function has been setting through 3 major programs, named Agribusiness Development Program, Food Security Development Program, and Farmer Wealth Increasing Program.

Agribusiness Development Program is held to push and facilitate public business by giving public direct aid for the purposes of breeding business, fattening, artificial insemination, animal health service, insemination service, etc, Food Security Program is reflected in the implementation on breeding, animal health, public veterinary health, animal feed availability guarantee, and livestock farming regulation. Therefore, this program is focussed on issue of regulations (steering function), meanwhile farmer Wealth Increasing Program is developed to increase farmer and government officer know how by establish training centres.

To support those programs and to achieve sustainable agricultural development, government need to develop livestock production effort through biotechnology engineering, by establishing an institution which are responsible to develop technologies such as Embryo Centre located at Cipelang, Artificial Insemination Centre located at Lembang and Singosari, Livestock Research Centre located at Bogor, Veterinary Research Centre located at Bogor, Livestock Product Quality Assessment Centre located at Bogor, Animal Drugs Quality Assessment and Certification Centre located at Serpong, Veterinary Pharmacy Centre located at Surabaya, and Veterinary Investigation and Assessment Centre located on 7 Provinces all over Indonesia.

These Institutions has major function to produce and assess quality of animal vaccine, animal drug and animal products, and support the increasing of livestock production, in order to maintain sustainable agricultural development.

BIOTECHNOLOGY APPLICATION TO INCREASE LIVESTOCK PRODUCTION

To gain better cattle quality, government has done some efforts to increase efficiency of existing resources usage for cattle production.

Cipelang Embryo Centre (BET Cipelang)

Livestock production through embryo transfer application could accelerate cattle population and genetic quality. Embryo transfer program has more advantages than artificial insemination, especially on consume time to produce first class breed. iotechnology application also being held as public introduction to stimulate agribusiness system. On the other hand, biotechnology development has become government guarantee to protect farmers to gain sustainable livestock production.

The result of embryo production from year of 2001 to 2003 tends to increase as follows : 238, 330, and 351 embryos, but on 2004 it has decreased into 235 embryos, meanwhile embryo transfer application tends to decrease from 2001 to 2004 as follows : 336, 241, 208 and 203 embryos. The rate of cattle birth by using embryo transfer from 2001 to 2004 is as follows : 44, 26, 55 and 47 heads. The lack of birth rate condition caused by the defect of embryo which as impact of unproductive age of the parents. The use of FSH and Prostaglandin hormone to gain superovulation, could also cause embryo defect, not mention, the embriyo certificates is not facilitated on information of parent pedigree meat and milk production capacity and quality such as fat and protein contain on milk production.

Lembang and Singosari Artificial Insemination Centre (BIB Lembang and Singosari)

Artificial Insemination Centre has main function to produce and control the quality of frozen semen, and develop artificial insemination all over Indonesia. To implement its function, Artificial Insemination Centre is facilitate with 8 bull types, which are Bali, Ongole, Madura, Brahman, Limousine, Simmental, Angus and Fries Holstein (FH).

The major goal of frozen semen production is to improve cattle genetic quality. The frozen semen production from 2000 to 2004 is as folows : 353.878 dosages, 525.289 dosages, 929.335 dosages, 864.990 dosages and 150.967 dosages, meanwhile, distribution reach 59.402 dosages, 567.598 dosages, 844.088 dosages, 531.529 dosages and 102.956 dosages.

The result of fertility evaluation in 2004 has showed the average of CR Ratio 81,57 % and S/C Ratio 1,26. The highest one is Angus with CR 86,64 % and S/C 1,18.

Biotechnology development could also determine sex type of cattle as tested by Singosari Artificial Insemination Centre which has produced 70,71% of bull birth and 96,55% of daughter cow birth. But they has not tested that it could cause pregnancy on imported cattle from New Zealand at Baturaden First Class Breeding Centre (BPTU Baturaden).

Problem need to solved is the quality semen production can be verity by improving the standard of breed, published by Directorate General of Livestock in 1999, the standard should informs the quality of parent's pedigree in producing semen

As a centre of artificial Insemination, BIB LEMbang and Singosari are facilitation bulls under condition 12 of 78 bulls with poor semen quality, abnormal genital apparatus, which has not replaced yet. Meanwhile bulls which suffered reproduction disease such as Leptospira, were still have produced semen that reach 16.050 dosages and has been distributed up to 5.688 dosages which will potentially cause disease pandemic.

Another problem is the lack of breeding program for inseminated female cows which will cause negative impact to decrease mother cow population due to unselected slaughtering of productive mother cow.

Surabaya Veterinary Pharmacy Centre (Pusvetma)

Surabaya Veterinary Pharmacy Centre known as Pusvetma has main duty to produce and distribute vaccine, anti serum, diagnostic and other biological material, while in line

with animal diseases controlling and eradication program, prior to infectious animal disease which cause economic loss and spread from animal to human (zoonosis).

Vaccine production from 2001 to 2003 is 9.549.300 dosages, 11.541.800 dosages and 3.979.284 dosages. Antigen production is 10.489.300 dosages, 12.871.800 dosages and 5.499.284 dosages.

Production and distribution line activities consist of vaccine and antigen research, production methodology research, vaccine quality monitoring and product development to fulfil the need of vaccine or animal drugs demand.

Pusvetma has problem regarding some damages of laboratory equipment that may influence vaccine production. It has not characterized "the seed" as main raw material of Anthrax and Brucellosis vaccine production that will influence the capability of vaccine on tracing the main cause of disease. They still use formaldehyde (formalin) as raw material to inactivate vaccine which may cause dangerous residues on meat. Pusvetma also still using Lanolin and Paraffin as raw material of SE vaccine production, which make it difficult on application.

Animal Product Quality Assessment Centre-Veterinary Investigation and Assessment Centre (BPMPP, BBV and BPPV)

Veterinary Investigation and Assessment Centre (known as BPMPP, BBV and BPPV) have function to control product security and rapid service for animal disease problem. They have to do assessment to find dangerous residues on animal product that may endanger human life. Those assessment had always been improving through development of method technique.

First Class Breeding Centre (BPTU)

BPTUs have main function to manage the breeding production and marketing. Each of them is provided with different types of cattle breed depend on its duty from Directorate General of Livestock.

BPTU Siborong-Borong (North Sumatera)

BPTU Siborong-Borong produce Landrace pig breed, Yorkshire, Duroc, Hampshire, Murrah and Local Buffalo.

Problems occurs during breeding process are population between male and female pig has not follow the true sex ratio. They also have no guidance in running progeny and performance test. Those problems cause minimum birth rate from 2002 to 2005 only 3.167 heads which actually should be reach 5.830 heads of pigs, and only 1.184 heads could fulfil criteria as breed. Murrah and Local Buffalo even worst because it could not produce breed at all.

BPTU Sembawa (South Sumatera)

BPTU Sembawa has major program to produce two-function cow (as meat production and as animal power) which gain by crossing Simbra cow and FH cow. They now manage 394 heads of cows consist of 49 heads result from crossing with FH and the rest of 185 heads consist of Simbra, Brangus and Brahman. These 185 cows will not use in breeding program.

Those crossing program is planned to gain 50 % FH gene with feed conversion 0,4 kg/day and milk production 6 l/day. The main problem they face is 117 heads of cows they have suffer from Infectious Bovine Rhinotracheitis (IBR).

BPTU Pleihari (South Kalimantan)

BPTU Pleihari has run breeding program by crossbreed Mojosari male duck with 70 % Alabio female duck which result Mojosari Alabio (MA), that will be used in production of eggs until third generation before reducing.

Problem that occur is parent stock which should be distributed as a final stock did not absorb by breeder, that may increase maintenance cost of the institution.

BPTU Padang Mangatas (West Sumatera)

BPTU Padang Mangatas has main duty to produce cow breed. The amount of cow they have is 457 heads, which consist of 7 heads FH, 63 heads Simmental and the rest are Limousine, Simmental Cross and Brahman Cross.

Problem that occur is BPTU has not a good breeding program, although there are cows from sub-tropic and tropic region which should need the goal of up grading or synthetic group during run cross-breeding. Another problem that BPTU has not calculate the nutrition sufficiency according to age of the cow during feed the cow.

Regarding to investigation result of BPPV, 187 cows was infected by IBR but the BPTU has not done following action yet.

BPTU Baturraden (Central Java)

Like other BPTUs, The BPTU Baturraden also has main duty to produce cow breed. The farm has been located in two separate areas which are Tegalsari and Limpakkuwus. Nowadays, Tegalsari are breeding about 272 cattle, while Limpakkuwus are breeding about 167 cattle.

Based on inspectorate general database, Tegalsari has 173 cows and 99 bulls. About 130 out of 173 cows were identified as carrier of Brucellosis disease. The head of BPTU Baturraden has been issued the proposal for terminating those infected cows. On the other hand, Limpakkuwus has a similar problem. 146 out of 167 cattle had been infected by Para Tuberculose disease. 21 calf that born from infected cows are identified as carrier. Thus, by April 2006, there are 167 cattle have been positively infected by Para Tuberculose disease on Limpakkuwus farm.

Food Fed Quality Assessment Centre (BPMPT) Bekasi

The BPMPT Bekasi has main function to maintain the quality of food fed to cattle. This institution is standing as technical agent that directly supervised by Director of Ruminant and Non Ruminant on The Directorate of Livestock Production Management.

In 2005, BPMPT has tested several foods fed samples to achieve the requirement of the Indonesian standard of quality control (SNI) and other technical requirements. Most cases they found are manipulating the ingredients concentrate in the packages. Although the food fed producer were claimed that package label was match with the certificate, the result of laboratorial test has a different conclusion.

Center Research and Development Cattle Breeding (Puslitbangnak)

1. Research Development integrate farm enterprises livestock plant has not been doing with order. The activity is aim to complete the basis of efficiency farm enterprises concept with approachment system, continue and waste zero through integrate development farm enterprises livestock plant according agroekosistem and farm enterprises type.
2. Development institute unit seed source of (UPBS) duck, sheep, vaccine poultry and crosscut Ox has not been planed with order and is carefully. arget of activity that is :
 - a) PBS livestock sheep, aim to increase and maintain the amount of pre eminent sheep source seed to fulfil necessities need all breeder.
 - b) UPBS livestock duck, aim to increase and maintain the amount of pre eminent duck source seed to fulfil necessities need all breeder.
 - c) UPBS crosscut Ox, aim to pioneer formed facility candidate and yield male candidate seed result of selection.
 - d) UPBS veteriner, aim to increase and maintain the amount of seed source of poultry vaccine to fulfil necessities all pharmacy entrepreneur.
3. Unit Balitvet vaccine pilot development up to inspection moment can be told that :
 - a) Vaccine formulation which have been made about 36.000 doses which is as still in the form of seed/dam/germ because availability of especial materials like SPF (Spesific Pathogenic Free) for the increase of antigen cannot be provided by distribution in gross at the same time;
 - b) Inaktif ND-AI combination vaccine in potency test at spawn chicken in laboratory, in spite of because availability of adequate cage for the examination of very limited, do that have to interchanged with activity of other research;
 - c) Space produce vaccine (including attempt cage/test) still in course of repair and settlement.

CONCLUSSION

It can be concluded that there are still haved to do to implement biotechnology as a technique production of livestock in Indonesia, even thought this technology promised a good result in future.

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