INTERNATIONAL JOURNAL ON MANAGEMENT AND EDUCATION HUMAN DEVELOPMENT

J. Management & Education Human Development

ISSN: ISSN: 2775 - 7765
web link: http://www.ijmehd.com

The Improvement Conservation Model of Germ Plasm Sahiwal Cross Cattle Although Agribusiness Approach in South East Sulawesi Province - Indonesia

Wayan Sura[1], La Panga[2], Fara Sasmita [3], Ayu Lestari Dewi [4]

[1]Lecturer at the Faculty of Animal Husbandry STIPER Kendari,
[2,3,4]Lecturer of Faculty Agriculture Technology of Unsultra

Received: 20/08/2021 Accepted: 26/12/2021 Published: 13/02/2022

Representative e-mail: ir.lapanga61@gmail.com

ABSTRACT

This study aims to (1) deliver the right adaptation model of cross-legalized Sahiwal cow germplasm, its dual porpose as a producer of beef and milk in Southeast Sulawesi (2) Prevent the extinction of Sahiwal Cross Cattle in Southeast Sulawesi, (3) Improve genetic quality of Sahiwal Cross Cows the community through Artificial Insemination (IB) technology uses FH cement to increase production and productivity. This research was carried out in Southeast Sulawesi Province from April to August 2018. This research was a Survey study, meaning that research describing certain objects describing the Study of Sahiwal Cattle Germplasm Adaptation Model Cross Dual Porpose Cattle Producing Meat and Milk. This research is classified into a qualitative descriptive research group, namely the search for facts with the right interpretation in order to determine the development of Sahiwal Cross cattle both in terms of increasing population and genetic quality. The data analysis technique used in this study was qualitative descriptive analysis. The results showed that: (1) Protection and preservation of Sahiwal Cross Cattle germplasm is one alternative to increase population and improve productivity of Sahiwal Cross Cattle in Southeast Sulawesi; (2) The development of cross-validated cattle adaptive is still widely found in Konda Subdistrict Konawe Selatan District, when compared to Bombana, Konawe and Kolaka Regencies (3) The right adaptation model to protect and preserve living cross-Sahiwal cattle germplasm is In-Situ Conservation / In-situ prescriptions, namely limiting strict crossing with local cows and maximizing the implementation of applied technology of Artificial Insemination (IB) for crossing two legitimate Sahiwal cattle with two FH cattle so that the Sahiwal cross cattle are expected can be have 75% of milk Cow type with Blood Resilience's Index's.

Keywords: *Conservation, Sahiwal Cross, Germ plasm, Agribusiness*

I. INTRODUCTION

Sahiwal Cross cow is a dual-porpose type cow as a milk producer and also as a beef or beef cattle producer. In Southeast Sulawesi, the existence of the Sahiwal Cross Cattle was initiated by the SESTAD Project activities funded by BANK ASIA/Asian Deployment Bank). The activity of procuring Sahiwal Cross Cattle (Dual Porpose Cattle) that produce Meat and Milk in Southeast Sulawesi from 1982 to 1990. The SESTAD/ADB project with a central activity in Wawolemo Village, Pondidaha District, South Konawe Regency in the context of distributing livestock assistance to the community. The first Sahiwal Cross cattle were imported from India for the distribution of livestock to the community in Southeast Sulawesi Province in 1986 as many as ± 200 females and 20 males, with the distribution areas of the SESTAD project in Konda District, Landono District, Lainea District, and Punggaluku. This cow is a large type of cattle and is able to adapt well in tropical areas such as Indonesia

The characteristics/specific characteristics of Sahiwal Cross cattle include large body type cattle with a body weight of adult females reaching 550 kg and adult males reaching 650 kg, strong bones with compact muscles, thin loose skin, fine thin fur with a grayish white color to grayish white color. brownish red, horned and not hump. Large udders characterize the type of dairy cow with a fairly high milk production. Environmental adaptation to tropical temperatures is quite good, more tolerant to ectoparasite attacks, disease resistance and productivity is quite high.

The livestock farmers who have managed Sahiwal Cross cattle with an intensive pattern are farmers in Konda District. Farmers in Konda Village by providing forage feed in sufficient quantities, plus the provision of household industrial waste in the form of tofu dregs to taste. The cattle have been able to give birth well too. In addition to

Co-responding Author : La Panga
Universitas Sulawesi Tenggara, Indonesia

producing calves, the livestock can also be milked to produce excess milk from the needs of the children, which is ± 5-7 liters of milk every day during lactation. This is an advantage for farmers who have added value from maintaining this dual-porpose type of cattle. This is beneficial for the farmers because the sale of milk as an additional income can support the daily necessities for the farmers.

The intensive maintenance of Sahiwal Cross Cattle mentioned above had progressed well between 1990-1998, at which time the government's attention had taken place both in terms of fostering the breeders themselves and in terms of distribution of production in the form of marketing fresh milk, which was still handled well by the government in this was done by the Health and Safety Division of the Provincial Livestock Service Office at that time.

This condition has changed since after 1998, the enthusiasm of farmers decreased because the government's attention was no longer focused on either coaching the breeders or in terms of sheltering and distributing their products, at one time there was coaching and at other times there was no, as well as distribution and marketing. milk production handles and accommodates the milk production of farmers because there is no clarity on the continuation of the program and funds that support activities, so that it has an impact on the expected continuity of production. Finally, gradually the impact on population development and genetic quality of livestock, especially Sahiwal Cross cattle in Southeast Sulawesi, was drastic. The development of Sahiwal Cross cattle in Southeast Sulawesi tends to be relatively low in the last 15 years (1999-2014), but the slaughter of cattle tends to increase in the same period. The factors that hinder its development are the rearing system which returns to the semi-intensive system because the enthusiasm for rearing by farmers is very low, side business, growth is slow, and reproductive efficiency is low.

The protection and preservation (conservation) of Sahiwal Cross Cattle germplasm is one alternative to increase the population and improve the productivity of Sahiwal Cross Cattle business in Southeast Sulawesi. The right conservation model in protecting and conserving the germplasm of living sahiwal cross cattle is In-Situ Conservation/in-situ preservation, namely strict cross-breeding restrictions with local cattle and efforts to maximize the implementation of applied technology of Artificial Insemination (AI) for cattle. sahiwal cross with pure FH cattle two (2) times so that sahiwal cross cattle have dairy type blood as much as 75%.

To increase the population of sahiwal cross cattle as a dual-porpose type producing meat and milk in Southeast Sulawesi, it is necessary to determine and map the right conservation areas. Some of the things that have been done are efforts to increase the population of Sahiwal Cross cattle, increase the quality of human resources for breeders, expand the Forage Farm for Animal Feed (HPT) and increase the quantity of fortifying feed in the form of tofu and soybean dregs produced from household industrial waste.

II. RESEARCH METHODS

This research was conducted in Southeast Sulawesi Province from April to August 2018. The location determination can be done purposively based on the area that has sahiwal cross cattle. The research locations are the districts of South Konawe, Konawe, Bombana and Kolaka.

The population in this study were all sahiwal cross cattle breeders in each district. While the sampling technique of research sites in each district can be determined as one (1) sub-district consisting of two (2) villages so that the overall research location is 4 sub-districts and eight (8) villages.

This research is a descriptive study, meaning research that describes a particular object that describes the Study of Germplasm Conservation Model for Sahiwal Cross Meat and Milk Producers. The approach used is a qualitative approach. This research is classified as a qualitative descriptive research group, namely finding facts with the right interpretation with the aim of knowing the development of Sahiwal Cross cattle both from the aspect of increasing population and genetic quality. The data analysis technique used in this study is qualitative descriptive analysis and SWOT analysis, where qualitative descriptive analysis is to determine the development of Sahiwal cross cattle in Southeast Sulawesi with factual conditions in the field, while SWOT analysis is used to find out the strengths, weaknesses, opportunities and challenges in studying the germplasm conservation model of beef and milk-producing sahiwal cross cattle in Southeast Sulawesi.

Co-responding Author : La Panga
Universitas Sulawesi Tenggara, Indonesia

III. RESULTS AND DISCUSSION

3.1. The Population of Sahiwal Cross Cattle in Southeast Sulawesi

3.1.1 Early Distribution of Sahiwal Cross Cattle in Southeast Sulawesi

Tabel , 4.1. Sebaran Plasma Nutfah Sapi Sahiwal Cross di Sulawesi Tenggara

No.	Lokasi Penelitian	Jenis Kelamin Ternak Sapi		Total (ekor)	Keterangan
I	Kecamatan Konda Kab. Konawe Selatan	Jantan (ekor)	Betina (ekor)		
1.	Desa Alebo	5	26	31	Proyek SESTAD/
2.	Desa Cialam Jaya	2	6	8	ADB 1986-1990
	Kec. Konda	7	32	39	Ditempatkan di Lab. Range Desa Wawolemo Kab. Konawe, sebnyak 200 ekor betina dan 20 ekor jantan. Disebar di Kec.. Konda, Lainea, Landono, Punggaluku
II	Kecamatan Lambuya Kab. Konawe				
1	Desa Awuliti	2	1	3	
2	Asaki	1	3	4	
	Kec. Lambuya	3	4	7	
III	Kecamatan Toari Kab. Kolaka				
1	Desa Anawua	1	4	5	
2	Desa Lamunre	0	2	2	
	Kec. Toari	1	6	7	
IV	Kecamatan Poleang Timur Kab. Bombana				
1	Desa Bambaea	0	1	1	
2	Desa Biru	1	2	3	
	Kec. Poleang Timur	1	3	4	
V	Kec. Lainea Kabupaten Konawe.				
1	Desa Laeya	1	2	3	
2.	Desa Punggaluku	0	1	1	
	Kecamatan	1	3	4	
	TOTAL SULTRA	13	48	60	

Sumber, Hasil Penelitian, Lapanga, dkk. 2018

Based on the results of the survey in the field, it was found that the Sahiwal Cross type of cattle was found. The existence of these cattle is basically not pure or has gone through several cross-breeding with other cows such as Bali cattle. Sahiwal cross cattle location distributed in Pondidaha Sub District Konawe Regency, then have been distributed to Konda, Landono, Lainea, and Punggaluku Sub Districts in 1990 year. Then there was a cross with local cattle and sales, resulting in a shift in the area of maintenance and genetic shift due to cross breeding. The data found in several areas such as Lambuya sub-district shifting from Landono sub-district, Toari sub-district came from seedlings in Punggaluku sub-district, and East Poleang sub-district obtained from Pondidaha sub-district.

3.1.2. Characteristic of Sahiwal Cross and it's Distributed in Southeast Sulawesi

The characteristics and number of Sahiwal cross cattle in the research location are presented in the following table:

Based on Table 4.1 it shows that the distribution of sahiwal cross cattle in Kolaka Regency is still present, although the numbers are small. The distribution of Sahiwa Cross cattle is found in Anawua Village and Lamunre Village. There are 9 sahiwal cross cattle in this sub-district, of which 3 are bulls and 6 are female.

3.1.3. Habitual Adaptation Sahiwal Cross at South Konawe Districts

Based on the results of the survey in the field, it was found that the Sahiwal Cross type of cattle was found. The existence of these cattle is basically not pure or has gone through several cross-breeding with other cows such as Bali cattle. Sahiwal cross cattle in South Konawe Regency are located in Konda District, namely Alebo Village and Cialam Jaya Village. The number of cows in Konda District, South Konawe Regency can be seen in Table 4.1

Based on Table 4.1, it shows that the number of sahiwal cross cattle in South Konawe Regency until now, the number of sahiwal cross cattle in Alebo Village and Cialam Jaya Village. There are 39 sahiwal cross cattle in this research location, of which 7 are male and 32 females.

3.1.4. Habitual Adaptation Sahiwal Cross at Konawe Districts

The development of sahiwal cross cattle in Konawe Regency is not too much when compared to other districts in the past when the allocation of sahiwal cross cattle. The allocation of sahiwal cross cattle is in Lambuya District, Awuliti Village and Asaki Village. Over time, sahiwal cross cattle have decreased in population due to economic demands experienced by farmers so that the cattle are sold and some have died. However, there are some people who have sahiwal cross cattle which still exist today. The Sahiwal Cross cattle in Lambuya District can be seen in Table 4.1.

Based on Table 4.1 shows that the development of sahiwal cross cattle in Lambuya District is in Awuliti Village and Asaki Village. There are 3 sahiwal cross cattle in Awuliti Village, 2 male and 1 female, while in Asaki Village there are 4 cows with 1 male and 3 females. This number illustrates that the Sahiwal Cross cattle in Konawe Regency are experiencing a decline in population. This incident certainly illustrates that there is a need for follow-up to both farmers and the government in maintaining or increasing the population of sahiwal cross cattle.

3.1.5. Habitual Adaptation Sahiwal Cross at Bombana District

The number of livestock populations in Southeast Sulawesi places Bombana Regency in second place after South Konawe Regency. This number illustrates that in general Bombana Regency has great potential for cattle development. The development of cattle in this area is not only for Bali cattle. However, there are still several other types of cattle, including the sahiwal cross. Sahiwal cross cattle to this day are still found even though they have been crossed with local cattle. As for the sahiwal cross cattle in Poleang District can be seen in Table 4.1

Based on Table 4.1, it shows that the development of sahiwal cross cattle is in Bambae Village and Biru Village, Poleang Timur District. In Bambae Village there is 1 female sahiwal cross and in Biru Village there is also 1 female so that in total there are 2 cows.

3.2 Sahiwal Cross Cattle Conservation Model in Southeast Sulawesi.

Article 20 paragraph (1) of Law Number 5 of 1990 classifies animal species in full, the article reads:
"Plants and animals are classified into types:

a. protected plants and animals;
b. unprotected plants and animals."

Article 21 paragraph (2) of Law number 5 of 1990 which reads about the prohibition of unfair treatment of protected animals that:

"Everyone is prohibited from:
a. catch, injure, kill, keep, possess, maintain, transport, and trade protected animals alive;
b. storing, possessing, maintaining, transporting, and trading protected animals in a dead state;
c. releasing protected animals from one place in Indonesia to another place inside or outside Indonesia;
d. trade, keep or own the skin, body or other parts of protected animals or goods made from parts of these animals or release them from one place in Indonesia to another place inside or outside Indonesia;
e. take, damage, destroy, trade, keep or possess eggs and/or nests of protected animals."

The criminal sanction for a person who intentionally violates the provisions as referred to in Article 21 paragraph (2) is a maximum imprisonment of 5 (five) years and a maximum fine of Rp. 100,000,000.00 (one hundred million rupiah).

Then in Article 22 paragraph 1 jo. paragraph 3 and explanation of Article 22 paragraph (3) of Law number 5 of 1990 There are *exceptions* to the capture of protected animals, which can only be carried out for the porposes of research, science, and/or rescue of the relevant plant and animal species. In addition, exceptions from the prohibition on capturing protected animals can also be made because protected animals endanger human life. Danger means not only threatening human life but also causing disturbance or unrest to the peace of human life, to material losses such as damage to land or crops or agricultural products.

The general definition of conservation is human management of the use of the biosphere so as to generate sustainable benefits for present generations and maintain its potential to meet the needs and aspirations of future generations. Meanwhile, conservation of animal diversity is the sum total of all activities related to the management of genetic resources that can be used and developed as well as possible to meet current and short-term needs for food and agriculture, and still ensure diversity to meet all possible long-term needs.

There are several reasons or considerations in conserving clumps of ruminants, especially sahiwal cross cattle, namely economic, scientific, cultural and historical considerations.

3.2.1. Economic considerations

This consideration is a practical consideration based on the assumption that the preservation of certain clumps or strains will contribute to increasing the efficiency and or quality of production for commercial livestock in the future. This is a reasonable consideration because it is known that production and marketing will always change from time to time. The economic benefits of conservation are difficult to predict because future changes are difficult to predict. From these economic considerations, the clumps that are candidates for conservation in sahiwal cross cattle have the following criteria:

(1). One trait, several properties or a combination of certain characteristics that have important economic value. (2). One trait, several traits or a combination of certain traits that currently lack important economic value, but will become important in the future. (3). The presence of a high frequency of one gene with a large influence of traits that have important economic value. (4). There is a high frequency of a gene that has a large influence on traits that currently have less economic importance, but are likely to be important in the future. (5). The characteristics of a clump that are less prominent, but when crossed with other clumps, it is expected to have a relatively high heterosis value.

3.2.2. Scientific Considerations

Scientific considerations for maintaining livestock genetic resources are based on the reason that each population has different genetic diversity. It plays an important role in explaining biological processes. So that if the diversity is extinct then the opportunity for scientific progress will also be lost. In some cases, genetic diversity will be of direct use to livestock. But in other cases, livestock can be used as a model for other species. Based on scientific considerations, a clump needs to be conserved if it meets the following criteria:

(1). If the selection is carried out, it has a big risk. (2). Having traits/characteristics that are rarely found in other populations, even though these traits do not have important economic value. (3). If there are several choices, then what is conserved is the clump that is least contaminated by crossing with other clumps. Priority is given to the local population or native clumps in general, cross with introduced clumps.

3.2.3. Cultural and historical considerations

Cultural and historical considerations have an important role in the conservation of a particular family or species. Conservation of certain species can provide visual evidence of the heritage of a particular nation or region. Besides, it is possible that a certain family is related to a certain ethnic tradition. Cultural and historical considerations for the conservation of a clump if it meets one or more of the following criteria:

(1). Has real value nationally and regionally. (2). Having the advantage or ability to maintain environmental or ecological balance where this clump is needed in the preservation of a vulnerable environment. (3). Has value in agro-tourism because of its special shape, color, behavior. (4). From the description above, it can be seen that conservation considerations for a clump are based on economic, scientific, and historical cultural considerations

IV. RESULT & DISCUSSION

There are three (3) general methods of livestock genetic resource conservation programs that have been implemented by livestock breeding communities, namely:

(1). Maintaining live cattle population. (2). Frozen storage of genetic material in the form of haploid gametes, namely semen (3). DNA storage

The protection and preservation (conservation) of Sahiwal Cross Cattle germplasm is one alternative to increase the population and improve the productivity of Sahiwal Cross Cattle business in Southeast Sulawesi. The right conservation model in protecting and conserving the germplasm of living sahiwal cross cattle is In-Situ Conservation/in-situ preservation, namely strict cross-breeding restrictions with local cattle breeds and efforts to maximize the implementation of applied technology of Artificial Insemination (AI) for cattle. sahiwal cross with pure FH cattle two (2) times so that sahiwal cross cattle have dairy type blood as much as 75%.

To increase the population of Sahiwal Cross cattle as a dual-porpose type producing meat and milk in Southeast Sulawesi, it is necessary to determine and map the appropriate conservation areas. Some of the things that have been done are efforts to increase the population of Sahiwal Cross cattle, increase the quality of human resources for breeders, expand the Forage Farm for Animal Feed (HPT) and increase the quantity of fortifying feed in the form of tofu and soybean dregs produced from household industrial waste.

Based on the results of this study, the target area for the germplasm conservation area of Sahiwal Cross cattle as a milk producer in Southeast Sulawesi is Konda District, South Konawe Regency with the consideration that this area has a high population of sahiwal cross compared to the three regencies that became the research area. it also has good quality breeder human resources and the availability of forage fodder for livestock as well as the availability of household industrial wastes such as tofu dregs and soybean dregs which can boost the production and productivity of meat and milk in sahiwal cross cattle.

4.1. Sahiwal Cross Cattle Business Development Strategy

The development of sahiwal cross cattle business is carried out using a SWOT analysis approach. The SWOT analysis in question aims to determine the strategies that can be applied in order to realize business development in accordance with what is expected. In determining the strategy, the main step that must be taken is to be able to identify all the potentials that can be strengths in business development. Similarly, based on the results of the field review, the strategy for developing the sahiwal cross cattle business is presented in Table 2.

Strategy	Program	Aims
1. Increase production and productivity of Sahiwal cross cattle	Application of Artificial Insemination technology	Increase business productivity
2. Expanding the marketing network of fresh milk to increase the income of Sahiwal cross cattle farmers	Effective institutional strengthening	Establishment of effective and efficient institutional institutions
3. Increase in livestock population	Sahiwal cross cattle conservation model	Improving genetic quality and increasing population (in-situ conservation)
4. Improve product quality	Improvement of good management system	Maintaining good product quality
5. Facilitating public access as business actors to financial institutions to increase business capital	Building partnerships with banks and other financial institutions	The relationship between the community as business actors and financial institutions as supporting business capital

Based on Table 1. shows that there are 5 strategies that will be carried out to develop the sahiwal cross cattle business. This strategy is certainly considered capable of answering the problems and challenges that will be faced by farmers. From this strategy, it is expected to increase production, population of Sahiwal Cross cattle and provide maximum income for farmers.

4.2 Research Output

1. To increase the population and maintain the genetic quality of Sahiwall cross cattle, aspects that can support the development of Sahiwall Cross cattle will be carried out including (a) identification of the availability of forage feed and household waste residue, (b) Treatment Artificial Insemination (AI), (c) special treatment of sahiwall cross cattle that are in heat, which is characterized by restless cattle conditions and redness of the vulva. This action was taken to maintain the development and increase of the population of sahiwall cross cattle in Southeast Sulawesi.
2. To maintain the continuity and population of Sahiwall Cross cattle in Southeast Sulawesi, especially in South Konawe Regency, steps are carried out such as (a) a directed maintenance and management system, (b) the availability of effective pens, (c) reproductive management and mating, (d) selection of superior breeds and (e)

prohibition against slaughtering pregnant cows. This concept is carried out on the basis of experience as a business actor

3. Sahiwal cross cattle actually have the potential to be cultivated because they have a high amount of meat production when compared to local cattle.
4. Sahiwall cross cattle not only produce meat but also produce milk and fertilizer. This condition illustrates that sahiwall cross cattle have sources that can provide benefits for cultivation.
5. The introduction of the concept of genes and inheritance of sahiwall cross cattle will help the community as breeders to improve genetic quality in obtaining superior traits.
6. Protection and conservation (conservation) of the germplasm of Sahiwal Cross Cattle is one alternative to increase the population and improve the productivity of Sahiwal Cross cattle business in Southeast Sulawesi. The right conservation model in protecting and conserving the germplasm of living sahiwal cross cattle is In-Situ Conservation/in-situ preservation, namely strict cross-breeding restrictions with local cattle and efforts to maximize the implementation of applied technology of Artificial Insemination (AI) for cattle. sahiwal cross with pure FH cattle two (2) times so that sahiwal cross cattle have dairy type blood as much as 75%.
7. To increase the population of sahiwal cross cattle as a dual-porpose type producing meat and milk in Sulawesi Southeast Asia must be determined and mapped the right conservation area. Some of the things that have been done are efforts to increase the population of Sahiwal Cross cattle, increase the quality of human resources for breeders, expand the Forage Farm for Animal Feed (HPT) and increase the quantity of fortifying feed in the form of tofu and soybean dregs produced from household industrial waste.
8. There is an agreement between stakeholders involved in determining the germplasm conservation area for Sahiwal Cross cattle as a milk producer in Southeast Sulawesi, namely Konda District, South Konawe Regency with the consideration that this area has a high number of sahiwal cross populations compared to the three districts that became the research area. Besides that, it also has good quality human resources for livestock breeders and the availability of forage for animal feed as well as the availability of household industrial wastes such as tofu waste and soybean dregs which can boost the production and productivity of meat and milk in sahiwal cross cattle.

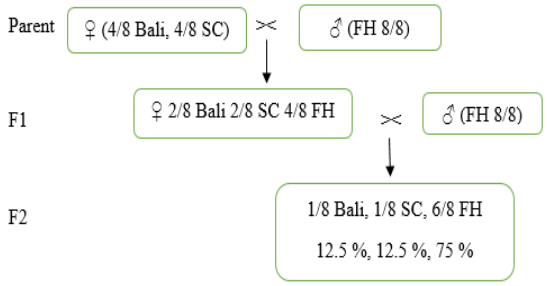
The follow-up treatment for the protection and preservation (conservation) of the germplasm of sahiwal cross cattle in this study is an alternative to increase the population and improve the productivity of sahiwal cross cattle in Southeast Sulawesi.

According to the results of the study on germplasm conservation of sahiwal cross cattle carried out in Konda District, South Konawe Regency, with the largest population of sahiwal cross, 32 productive adult females who are ready to be given IB treatment using pure FH semen (semen).

Improvement of genetic quality towards dairy cows (up grading) using pure FH frozen semen until the second generation with the consideration that the composition of the parent blood (parent) sahiwal cross is 4/8 bali with 4/8 sahiwal cross, then it will be crossed with pure FH so that the blood composition in F1 is 2/8 Bali, 2/8 Sahiwal cross, 4/8 FH. F1 is estimated to be born in year 2 of this study.

Then in the 4th year of this study, cross-breeding with IB was carried out between F1 and pure FH. In the 5th year, F2 will be born (the result of a cross between F1 and pure FH). F2 will have blood composition: 1/8 bali, 1/8 SC, 6/8 FH. Thus, the F2 has a blood composition towards dairy cows approaching 75%.

The marriage scheme is as follows:



Measurement of milk production in the first generation (F1) can be done in the fifth year of this study, when F1 has given birth for the first time. So, in the fifth year it was discovered that milk production for the first generation (F1) with FH blood composition was close to 50% (F1 blood composition: 2/8 bali 2/8 SC 4/8 FH).

Milk production in the second generation (F2) with FH blood composition approaching 75% (F2 blood composition 1/8 bali 1/8 SC 6/8 FH) can only be measured in the eighth year, when F2 gives birth for the first time.

So, the ideal blood composition expected in this study will only be achieved in the fifth year, and the measurement of milk production for F2 can only be carried out in the eighth year (or in the 2nd generation (F2) has given birth for the first time).

V. CONLUSION & SUGGESTION

6.1. Conclusion

The conclusions from the data tabulation report and data analysis on the study of the germplasm conservation model for beef and milk-producing sahiwal cross cattle in Southeast Sulawesi Province are as follows:

1. Model Protection and conservation (conservation) of germplasm is an alternative to increase population and improve productivity and prevent Sahiwal cross cattle which are almost extinct in Southeast Sulawesi.
2. The right conservation model in protecting and preserving the germplasm of living sahiwal cross cattle is In-Situ Conservation/in-situ preservation, namely strict cross-breeding restrictions with local cattle breeds and efforts to maximize the implementation of Artificial Insemination (AI) applied technology. Sahiwal cross cattle with pure FH cattle two (2) times so that sahiwal cross cattle have dairy type blood as much as 75%.
3. Sahiwal cross cattle no longer have genetic purity (plasma germ) because they have experienced several marriages with other local cows.
4. Development strategy for Sahiwal Cross cattle through limiting crosses with local cattle and maintaining the genetic quality of Sahiwal Cross which is still suitable for the environment and productive is found in Konda District, South Konawe District, Bombana District, Konawe and Kolaka District.

6.2. Suggestion

The suggestions for the study of the germplasm conservation model for beef and milk-producing sahiwal cross cattle in Southeast Sulawesi Province are as follows:

1. There is a need for strict supervision of restrictions on crossing sahiwal cross cattle with local cattle breeds.
2. There is a need for further research on sahiwal cross cattle to measure the success of crossing sahiwal cross cattle with dairy cattle.
3. It is necessary to increase the population of sahiwal cross cattle by improving genetic quality in order to maintain its sustainability.
4. There needs to be guidance on public awareness in maintaining and conserving sahiwal cross cattle.
5. There is a need for policy support from the government related to the development of sahiwal cross cattle in Southeast Sulawesi.

REFERENCES

Aboenawan, L. 1991. Weight Gain, Feed Consumption, and Total Digestible Nutrient (TDN) Pellets with Rumen Contents Compared to Grass Pellets in Male Sheep. Research report. Faculty of Animal Husbandry. Bogor Agricultural Institute. Bogor.

Akmal. 2000. Utilization of Rice Straw Wastelage as Feed Material for Male FH Cattle. Bogor Agricultural Institute. Bogor.

US. Sudarmono. Bambang. Y Sugeng. 2008. Beef Cattle. Self-Help Spreader. Jakarta.

Central Bureau of Statistics, 2017. Directory of Agricultural Companies, Slaughterhouses (RPH) and Slaughterhouses (TPH). Central Bureau of Statistics, Jakarta

Board on Agriculture National Research Council. 1993. Managing Global Genetic Resources. Livestock. Committee on Managing Global Genetic Resources: Agricultural Imperatives. National Academy Press, Washington, D.C., USA.

Castle M, Ajemian E. Hospital Infection Control: Principles and Practice, 2nd ed. Canada: John Wiley & Sons, Inc., 2012.

Directorate General of Livestock. 2010. Animal Statistics Book. Directorate General of Livestock. Jakarta.

Ensminger, M.E. 1987. Beef Cattle Science, Ed. The Interstate Printers and Publishers Inc. Danville. Illinois.

FAO. 2000. World Watch List for Domestic Animal Diversity, SCHERF, B.D. (Ed). Food and Agriculture Organization of the United Nations, Rome, Italy.

Gunawan, 1993. Madura cattle. First Printing, Canisius. Yogyakarta.

Halim. 2014. Regional Financial Accounting. Edition 4 Salemba Empat. Jakarta

La Panga, P. & Hardin, 2020. Agrobisnis & Pemberdayaan Masyarakat, Penerbit CV. Kanaka Media, Surabaya Jawa Timur.

La Panga, P. Hadirman & Hardin, 2020. Editor Prociding books Pengembangan Pertanian dan Peternakan Berbasis Kearifan Lokal dan Agroekoteknologis Penerbit CV. Kanaka

Ponzoni, J. A. M. van Aredonk, and H. Bovenhuis. 2006. Heritability estimates and response to selection for growth of Nile Tilapia (Oreochromis niloticus) in low-input earthen ponds. Aquaculture 261 : 479 – 486.

Rasyaf, M., 1994. Breeding Commercial Ducks. Kanisius, Yogyakarta.

Rashid, A. and Hartati. 2007. Productivity of Heifers from F1 Crosses (PO x Limousin and PO x Simmental) in People's Farms. National Seminar on Livestock Awakening Hal. 96-103

Sabrao. 1980. Animal Genetic Resources in Asia and Oceania. Proc. of a Workshop of the Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO) held at University of Tsukuba, Tsukuba Science City, September 3-7, 1979. Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Yatabe , Tsukuba, Ibaraki 305, Japan.

Revelation. J. 1992. IImu Nutrition for Poultry. UGM-Press, Yogyakarta.