

SFRN 2019

Security in
food,
renewable
resources,
and
natural
medicines



PROCEEDING

ISBN:978-602-51262-8-4



**3rd INTERNATIONAL CONFER-
ENCE ON SECURITY IN FOOD,
RENEWABLE RESOURCES, AND
NATURAL MEDICINES 2019
(SFRN 2019)**



hosted by,
Politeknik Pertanian
Negeri Payakumbuh



co-Hosted by,
Universitas Andalas
(UNAND)

Convention Hall Politeknik Pertanian Negeri Payakumbuh
INDONESIA

QUANTUM-LEAP OF AGRI-FOOD SYSTEM 4.0 AND DELIVERY OF SUSTAINABLE DE- VELOPMENTS GOALS (SDGS)

September 25-26, 2019



PROCEEDING
3rd INTERNATIONAL CONFERENCE ON SECURITY IN
FOOD, RENEWABLE RESOURCES, AND NATURAL
MEDICINES 2019 (SFRN 2019)

September 25-26, 2019
Convention Hall Politeknik Pertanian Negeri Payakumbuh
INDONESIA

Theme:
"QUANTUM-LEAP OF AGRI-FOOD SYSTEM 4.0 AND
DELIVERY OF SUSTAINABLE DEVELOPMENTS GOALS
(SDGS)"

Publisher
Politeknik Pertanian Negeri Payakumbuh
ISBN 978-602-51262-8-4



PROCEEDING
**3rd INTERNATIONAL CONFERENCE ON SECURITY IN FOOD, RENEWABLE
RESOURCES, AND NATURAL MEDICINES 2019 (SFRN 2019)**

Theme:
**“QUANTUM-LEAP OF AGRI-FOOD SYSTEM 4.0 AND DELIVERY OF
SUSTAINABLE DEVELOPMENTS GOALS (SDGS)”**

Steering Committee

Ir. Elvin Hasman, MP
Prof. Dr. Tafdil Husni, SE, MBA
Assoc. Prof. Dr.-Ing. Uyung Gatot S. Dinata, MT
Dr. Rusfrida, Spt, MP

Executive Chairman

Fithra Herdian, S.TP, MP

Co-Chair

Assoc. Prof. Dr. Eng. Muhammad Makky, Msi

Scientific Committee

Dr. Vasu Udompetaikul (Thailand)
Prof. Dr. B. Yogesha (India)
Dr. Darius El Pebrian (Malaysia)
Assoc. Prof. Dr. Samsuzana Binti Abd Aziz (Malaysia)
Dr. Shinichiro Kuroki (Japan)
Assoc. Prof. Dr. Eng. Muhammad Makky (Indonesia)
Dr. Fri Maulina, SP. MP (Indonesia)

Advisory Committee

Ir. Harmailis, M.Si
Ir. Edi Joniarta, M.Si
Ir. Darmansyah, MP

Reviewer

Assoc. Prof. Dr. Eng. Muhammad Makky, MSi
Assoc. Prof. Aflizar, SP, MP, P.Hd
Dr. Edi Syafry, ST, MSi

Editor

Fithra Herdian, S.TP, MP
Indra Laksmiana, S.Kom, M.Kom
M. Riza Nurtam, S.kom, M.Kom
Yuliandri, S.S.MTESOLLead
Resa Yulita, S.S., M.Pd.
Hudia, S.S., M.Pd.
Sri Nofianti, SP, M.Si
Yelfiarita, SP, MP
Nahda Kanara, SP, M.Si

Publisher

Politeknik Pertanian Negeri Payakumbuh
Jl. Raya Negara Km. 7 Tanjung Pati Kec. Harau, Kab. Limapuluh Kota, Sumatera Barat
26271, Telp: (0752) 7754192, Fax : (0752) 7750220, Email: p3m@politanipyk.ac.id



Organizing Committee

Indra Laksana, S.Kom, M.Kom
Haryadi Saputra, A.Md
Newis Yerli
Fidela Violalita, S.TP, MP
Ir. Deni Sorel, M.Si
M. Riza Nurtam, S.kom, M.Kom
Yuliandri, S.S.MTESOLLead
Resa Yulita, S.S., M.Pd.
Hudia, S.S., M.Pd.
Syarmila Devi, SP, M.ScAg
Ir. M.Syakib Sidqi, M.Si
Yulius Efendi, A.Md
Yasmardi, S.Sos
Sri Aulia Novita, S.TP, MP
Sri Nofianti, SP, M.Si
Efa Leninasfita

Annita, SP
Elita Amrina, Ph.D
Fitri Rosdianti, S.Sos
Hazanul Putra, SH
Bujang Sadad
Rita Elviza
Sufendri, SE
Lektri Marlina, SE
Gusdi Arjet
Ridwan
Yuslimar
Bismar Hendra
Dr. Eka Candra Lina
Hanalde, MSc
Amri Syahardi, MP
Hamsiah, S.Kom, M.Kom

Layout

Amrizal, S.Kom, M.Kom
Haryadi Saputra, A.Md
Annita,SP

Welcome Message
**Executive Chairman of The 3rd International Conference on Security in Food,
Renewable resources, and Natural Medicines (SFRN) 2019**



Dear Honorable ladies and gentlemen,

Good Morning and Assalamu'alaikum wr.wb

On behalf of the SFRN 2019 organizing committee, I am really honoured and delighted to welcome all of you to the 3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019 at the State Polytechnic of Agriculture Payakumbuh, West Sumatra Indonesia

Our technical program is rich and varied with 8 keynote speeches and 4 invited talks and more than 170 technical papers split between 8 parallel oral sessions and 1 poster sessions. The speakers and participants came from 8 different countries, consist of Academicians, Scientists, Researchers, Practitioners, Professionals, and Government Officials in multidiscipline branch of knowledge, who gathered here today to share and discuss new findings and applications of innovations for promoting Food Security, Renewable Energy, Sustainable Resources and HealthCare Free for All, in particular for those who in needs. As the chairman of conference 2019 SFRN, I know that the success of the conference depends ultimately on the how many people who have worked in planning and organizing both the technical program and supporting social arrangements. This year, the conference is jointly organized by the Payakumbuh State Agricultural Polytechnic and Andalas University. We also thank to the steering committee for their wise and brilliant advice on organizing the technical program; and also to the the Program Committee, both from the Payakumbuh State Agricultural Polytechnic and Andalas University, for their thorough and timely reviewing of the papers and to the Director of Payakumbuh State Agricultural Polytechnic and the rector of Andalas University, and the Head of the Institute for Research and Community Service of Andalas University, and Payakumbuh State Agricultural Polytechnic. Our recognition should go to the Organizing Committee members who have all worked really hard for the details of the important aspects of the conference programs and social activities, and then we extend our gratitude to our students who bore the arduous burden for preparing this event.

We hope this event is also a good step in gaining strengthened cooperation between our universities as we know that the State Agricultural Polytechnic of Payakumbuh is part of the Andalas University previously, of course the psychological relationship between the State Agricultural Polytechnic and the Andalas University is really close.

Finally on behalf of the committee, we apologize profusely for all the shortcomings and everything that is not properly in organizing this event and hopefully AES-Network contributes significantly to the research and technology for the good of humanity.

Thank you

Fithra Herdian, S.TP, MP

**Message from Afro-Eurasia Scientific (AES) Network
3rd International Conference on Security in Food, Renewable resources, and
Natural Medicines (SFRN) 2019**



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

On behalf of the AES Network, I am honored and delighted to welcome you to the 3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019 at the Agricultural State Poly Technique of Payakumbuh, Indonesia. I believe we have chosen a venue that guarantees a successful technical conference amid the culture, delicacy and scenery of Payakumbuh, the city of “Rendang”.

The AES-Network aims to Promote Livelihood Through Food Security, Promote Future Smart and Green Mobility by Using Renewable Energy, Promote Prosperity by Equally Managing and Distributing the Sustainable Resources and Promoting Enjoyable Long-Life by using Natural Medicines With Free Health Care For All. The AES-Network was established in 2018 and already have memberships from 12 countries. Our members consist of Academicians, Scientists, Researchers, practitioners, professionals, and government officials from multidiscipline branch of knowledge, who gathered and contributed their expertise to share and discuss new findings and applications of innovations for promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care for All. In particular, the network aims to alleviate the condition of those who in dire needs. In the future, we also expect to provide technical demonstrations, and numerous opportunities for informal networking for Promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care for All. In this opportunity, we invited you to become our members and join our efforts for a better life to all of mankind.

As a team, we acknowledge the existence of mutual interest among university and college educators, researchers, activists, business sector, entrepreneurs, policy

makers, and all society members. We must promote the need to strengthen cooperation for establishing Security in Food, Renewable Resources, and Natural Medicines in Africa, Europe, and Asia.

The AES-Network believe, a firm foundation for mutual collaboration with the spirit of equality and partnership and thereby contribute towards sustainable development in these three regions.

Therefore, through networking, friendships, and joint efforts, the capacity of our network can be enhanced to address major challenges in securing the Food, Renewable Resources, and Natural Medicines in Africa, Europa, and Asia. Our Network goals are to increase the awareness of educators, researchers, scientific community, business sector, entrepreneurs, and policy makers in Africa, Europa, and Asia, that the future of a better world, lies within their responsibilities, and to improve the networking, mobility and mutual collaboration of scientific community, business sector, entrepreneurs, and policy makers in Africa, Europe, and Asia to energize the delivery of Sustainable Development Goals.

Finally, I hope that, by registering our network, you will be provided a common platform and support the exchange of knowledge, while at the same time, we offer constructive dialogue across and within the various interest and stakeholder groups, including the intended beneficiaries, and arrived at the best solutions to our terminal goal, Promoting Food Security, Renewable Energy, Sustainable Resources and Free Health Care based on scientific evidence in Africa, Europa, and Asian region.

Thank You for Joining us!

President

Assoc. Prof. Dr. Eng. Muhammad Makky

Welcome Message
Head of Institute for Research and Community Service
Universitas Andalas



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

It is with great pleasure that I welcome the participants of the SFRN 2019 in Payakumbuh, the city of “Rendang”, the prime of Indonesian delicacy.

In this esteem event, we share the knowledges, and imparted it to the people. The quest for knowledge has been from the beginning of time but knowledge only becomes valuable when it is disseminated and applied to benefit humankind. It is hoped that this conference will become a platform to gather and disseminate the latest knowledge which can be adopted for securing the food, resources, and health for mankind, in Asian, European and African region.

Academics, Scientists, Researchers and practitioners from multidiscipline branch of knowledge who gathered here today will be able to share and discuss new findings and applications of innovations for ensuring food security, in particular for those who reside in developing countries. It is envisaged that the intellectual discourse will result in future collaborations between universities, research institutions and industry both locally and internationally. In particular it is expected that focus will be given to issues on environmental and sustainability. Therefore, we urge to all participants, to establish a scientific network that will voice the needs

Researchers in the multi sectoral aspects related to the benefit of mankind have been progressing worldwide. Food is a basic right, while energy drive the world. Human need a lot of resources so the civilization can be flourished. But human is not immune, and thus, ones need to take care of their health regularly. Modern Agri-food systems is the foundations of a decent life, a sound education and the achievement of

the Sustainable Development Goals. Over the past decade, we have witnessed a chain reaction that threatens the very foundations of life for millions of the world's people. Rising energy prices drove up the cost of food and ate away the savings that people otherwise would have spent on health care or education. Unsustainable plantation management induced forest fire and posed haze hazard to the whole Sumatra island and our neighboring countries.

The human cost of the food and energy crisis has been enormous. Millions of families have been pushed into poverty and hunger. Thousands more suffering from the collateral effects. Over the past year, food insecurity led to political unrest in some 30 countries. Yet because the underlying problems persist, we will continue to experience such crises, again and again -- unless we act now. That is why we are here today.

We must make significant changes to feed ourselves, and most especially, to safeguard the poorest and most vulnerable. We must ensure safety nets for those who cannot afford food, or energy, nor even a health service. We must transform agricultural development, markets and how resources is distributed. We must do so based on a thorough understanding of the issues. That is the only possible way we can meet the Goals of Sustainable Development.

Thank You,

Assoc. Prof. Dr.-Ing. Uyung Gatot S. Dinata,MT.

**Opening Ceremony
Rector of Andalas University**



Dear Honorable and Distinguished guests,
Ladies and gentlemen,

Assalamu'alaikum Warahmatullahi Wabarakatuh and Good Morning

I welcome the opportunity to address you at this important event.

It gives me great pleasure in welcoming you to this 3rd Conference on "Security in Food, Renewable resources, and Natural Medicines (SFRN)" 2019. I am delighted that so many have accepted our invitation. I am particularly happy that we have in this room, dedicated individuals from so many stakeholder groups — including our most respected and distinguished guest “The ministry of Agriculture of the Republic of Indonesia”. We also welcome the mayor of Payakumbuh and the Regent of Lima Puluh Kota. We extend our welcome to the civil society, the private sector, international organizations; the science community; and others dedicated to help create an environment in which people can escape food insecurity. Imagine what we can do together if we make the security for all as an our top priority, and pull in the same direction. We can make a difference in the lives of millions.

Food is a basic right. Food security are the foundations of a decent life, a sound education and the achievement of the Sustainable Development Goals Access to medicines - a fundamental element of the right to health. Health is a fundamental human right, indispensable for the exercise of many other rights in particular the right to development, and necessary for living a life in dignity. Moreover, human rights principles and language are being used to support resource access claims as rights-based approaches empower individuals and groups to gain or maintain access to natural resources

Much progress has been made during the last decades but much more needs to be done. Millions of people are Insecure worldwide, meaning that they either starve or they do not know from where their next meal, health care or resources will come.

Much of the progress on security has occurred at the expense of our environment. With business as usual, we foresee that the production improvements during the next decade will be less than the last one, while the environmental degradation will continue, and health will deteriorate significantly. Without available resources to seek, mankind will become endanger species in a very short time.

Solutions to the security problems need to be designed and implemented within a new and rapidly changing environment. Globalization and sweeping technological changes offer new opportunities for solving these problems. A number driving forces or trends must be taken into account in developing appropriate action. Some of the action needed, such as appropriate technology for small farms, is not new but it must be cast in the new and changing global and national environment, taking into account new opportunities and risks. I hope that by providing a forum for knowledge exchange, this conference will help identify the action to be taken. Furthermore, this conference will help to provide constructive dialogue across and within the various interest and stakeholder groups, including the intended beneficiaries, and arrive at the best solutions.

In conclusion, even if those responsible give high priority to achieving sustainable security for all and back it up with action, the world may not achieve the goal by 2030. But we will be much closer than with business as usual. I urge all of us to provide the strongest support for this event, to enable securing the food for all in the closest time possible. It is my sincere optimism that through the accomplishment of the objectives of this event, we will come to an important step nearer to secure the food for all.

Finally, I would like to thank the organizing committee who have spent their utmost efforts to prepare and manage this event successfully. Let me conclude my remarks by wishing our guests happiness, good luck and great success in the conference.

May I announce now the opening of the “3rd International Conference on Security in Food, Renewable resources, and Natural Medicines (SFRN) 2019” in Payakumbuh.

Thank you.

Rector,
Prof. Tafdil Husni, SE, MBA, PhD

Welcome Message
Director of Politeknik Pertanian Negeri Payakumbuh



Dear Honorable ladies and gentlemen,

Good Morning and Assalamu'alaikumwr.wb

I congratulate to all participants on the invitation and participate at our beloved campus Payakumbuh State Agricultural Polytechnic. I feel really honoured to welcome all of you at our event, the 3rd International Conference on Security in Food, Renewable Resources, and Natural Medicines (SFRN) 2019 at the Payakumbuh State Agricultural Polytechnic, Indonesia.

Food security is a very important aspect in a country's sovereignty. Food also determines the future direction of a nation. Many social and political fluctuation can also occur if food security is disrupted. Food availability that is smaller than its needs can create economic instability. This critical food condition can even endanger economic and national stability. In the current situation, there are many challenges in exteriorize food security, such as climate change, population, limited natural resources and other challenges both locally, regionally and globally.

Renewable resources are also our starting point to start sustainable development. Research on renewable resources is also very important as the solution in meeting the principles of sustainable development. As we know that Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability is the foundation for today's leading global framework for international cooperation - the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs)

The discovery of treatment based on local culture also contributes greatly to the good of humanity. Unfortunately, there are still many treatments that have not been carried out by scientific research. So, through this conference we hope it can be a trigger to increase in traditional plant-based treatments that not go through complex

chemical processes, so that the effectiveness of the pillars can be further suppressed and also contribute to the community's economy.

Finally, I would like to express my gratitude to all people who involved in organizing this event and to all of stakeholders who have helped to make this event go on successfully. Please accept my apologize for any shortage, Assalamu'alaikumwr.wb.

Thank you

Ir. Elvin Hasman, MP

Table of Content

Committee	i
Welcome Message from Executive Chairman	iii
Welcome Message from AES-Network	v
Welcome Message from Head of Institute for Research and Community Service Universitas Andalas	vii
Welcome Message from Rector of Andalas University	ix
Welcome Message from Director of Politeknik Pertanian Negeri Payakumbuh	xi
Table of Content	xiii

Keynote/Invited Speakers

Freshness Evaluation of Leafy Vegetables with Based on the Cell Membrane Properties <i>Graduate School of Agricultural Science, Kobe University, 1-1 Rokkodai, Nada, Kobe 6578501, Japan</i> (Shinichiro Kuroki)	1
Composite Materials - An Insight to a New Era <i>Malnad College of Engineering, Hassan, Karnataka, India</i> (B. Yogesha)	2
Precisions of Tractor Operations with Soil Sensor Implementusing Manual and Autopilot-automated Steering Systems on Oil Palm Replanting Area in Malaysia <i>Faculty of Plantation & Agrotechnology Universiti Teknologi MARA Melaka branch, Jasin campus 77300 Merlimau, Melaka, Malaysia</i> (Mohammad AnasAzmi, Darius El Pebrian)	3
Precision Agriculture: Digitization in Farming <i>Smart Farming Technology Research Centre Department of Biological and Agricultural Engineering Deputy Dean of Postgraduate Studies Faculty of Engineering Universiti Putra Malaysia</i> (SamsuzanaAbd Aziz)	4
Sustainable-Resources-Based Smart-Mobility in ASEAN: a New Concept of the Next-Generation Green-Transportation <i>ASEAN-U.S. Science and Technology Fellow (2018/2019), Association of South East Asian Nations (ASEAN) Secretariat. Dept. of Agricultural Engineering, Universitas Andalas, Padang 25163, West Sumatra, Indonesia</i> (Muhammad Makky)	5

Parasitoid as a Biological Control Agent of Rice Bug (<i>Leptocorisa oratorius</i> Fabricius): Effort Towards Food Security <i>Department of Food Crop, Payakumbuh State Polytechnic of Agriculture. West Sumatra. 26271. Indonesia</i> (<i>Fri Maulina</i>)	6
---	---

Intelligence Farming for Sustainability <i>Department of Agricultural Engineering King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand</i> (<i>Vasu Udompetaikul</i>)	7
---	---

Parallel Sessions

A. Food Security

Abundance and Potential of <i>Erionata thrax</i> L (Lepidoptera; Hesperidae) as an Insect Vector <i>Ralstonia syzygii</i> subsp. <i>celebesensis</i> Cause of Bacterial Blood Disease in Barangan in Deli Serdang Regency North Sumatera Asmah Indrawaty, Suswati	A1
The Study of Chemical Quality and Sensory of Egg Rendang in Payakumbuh Deni Novia, Indri Juliyarsi, Sri Mulyani.....	A7
Revival of Shifting Cultivation Pattern in Subdistrict of Mapattunggul Selatan, Pasaman Regency, West Sumatera, Indonesia Juli Yusran, Yonariza, Elfindri, Mahdi, Rikardo Silaban	A18
The Diversity of flower-visiting insects (<i>Musa paradisiaca</i>) and the Potential as a Spreading Agent <i>Ralstonia syzygii</i> subsp. <i>celebesensis</i> on Barangan Banana, in North Sumatera, Indonesia Suswati, Asmah Indrawaty, Rosiman, Maimunah	A31
Potential of Indole Acetic Acid Producing Bacteria as Biofertilizer in Increasing Production of Corn (<i>Zea mays</i> L.) Yun Sondang, Khazy Anty, Netti Yuliarti, Ramond Siregar	A37
Analysis of Inpara 3 Variety of Seed Farming Production Firdaus, Adri, Erwan	A45
Growth and Results of Some Shallots Varieties in Two Ways of Planting in the Lowland Syafri Edi, Yardha.....	A53
Some Perspectives on Food Security For Children: The Case of Rendang For Kids in West Sumatera Dessy Kurnia Sari, Donard Games, Atha Raihan Rusdi.....	A62

Farmer's Adoption Level for Inpara 3 and Inpari 34 Newly Rice Varieties Experiment in Swamp Land Areas, Betara District, West Tanjung Jabung, Jambi Suharyon, Lutfi Izhar	A67
Palm Oil Seed Premeditated Acclaim in Jambi Lutfi Izhar, Arni Diana, Salwati.....	A76
Water Resources Potency for Supporting Location-Specific Agricultural Policies and Innovations Salwati, Lutfi Izhar.....	A81
Improvement of Local Bungo Cattle Calving Rate With Artificial Insemination Bustami, Zubir, E. Susilawati, Sari Yanti Hayanti	A93
Performance and Productivity of Rice and Corn Intercropping in Dry Land of Jambi Province Jumakir, Adri, Rustam	A101
Prospects of Superior Variety Cane "PoJ 2878 Agribun Kerinci" in Increasing Income Farmers in Kerinci District, Jambi Province Endrizal, Araz Meilin, Julistia Bobihoe.....	A110
Determining Factors and the Elasticity of Demand Chicken Eggs Household Consumer in Sijunjung Regency Noni Novarista, Nofrita Sandi	A119
Application of POC from Leachate Landfill on Growth and Yield of Maize (<i>Zea mays</i>) Hasnelly, Syafrimen Yasin, Agustian, Darmawan	A128

B. Natural Medicine

Utilization of Medicine Plants by Suku Anak Dalam (SAD) in Bukit Duabelas National Park Area of Sarolangun District, Jambi Province Julistia Bobihoe, Sari Yanti Hayanti Endrizal	B1
The Effect of Kawa Daun Gambir (<i>Uncaria gambir</i> Roxb.) on the Malondialdehyde (MDA) Level of Heart Alloxan Induced Hyperglycemia Mice Husnil Kadri, Muhammad A'raaf, Julizar.....	B9
Banana Extract (<i>Musa paradisiaca</i>) as Alternative Natural Antibacterial to Prevent Dental Caries <i>Asterina, Yustini Alioes, Ovy Prima Damara</i>	B15

The Difference in the Effectiveness of Propolis and Triamcinolone Acetonide in Traumatic Ulcer Healing in Mucosa of the Oral Cavity <i>Yustini Alioes, Hamdan, Elmatris,SY</i>	B21
--	-----

C. Policy, Commercialization And Innovation (PCI)

Strategies for Developing SMEs (Small and Medium Enterprises) of “Rendang” with Strengthening Regional Innovation Systems in Payakumbuh City <i>Amna Suresti, Uyung Gatot S. Dinata, Alizar Hasan, James Hellyward, Rahmi Wati</i>	C1
Attitude Towards Technology Adoption Among Permanent Food Production Park Program Participants in Peninsular Malaysia <i>Zulqarnain1, Norsida Man, Juwaidah Shariffudin, Salim Hassan</i>	C16
Nutrient Contents of Parboiled Rice as Affected by Palm Oil Addition <i>Cesar Welya Refdi, Gita Addelia Nevara</i>	C22
Production Factors Affecting Taro Production in Sinaboi Sub-District Rokan Hilir Regency <i>Eliza, Shorea Khaswarina, Ermi Tety</i>	C28
The Role of Various Types and Dosage of Biological Compost (Bio-Compost) on Biology and Soil Fertility in Ginger (<i>Zingiber officinale. L</i>) <i>Misfit Putrina, Yulensri, Kresna Murti</i>	C38
Community Partnership Program in Processing Cassava Into Mocaf on Woman Farmers in Petapahan District <i>Amelira Haris Nasution, Nirmala Purba, Salvia S</i>	C45
The Effect of Addition of Na_2CO_3 Solution Into the Decaffeination Process of Dry Coffee Seeds on Physicochemical Characteristics of Coffee Powder <i>Ruri Wijayanti, Malse Anggia</i>	C55
Enhancing Innovation Performance and Commercialization in Higher Education Institutions: The Case of Andalas University <i>Donard Games, Hanalde Andre, Amri Syahardi</i>	C62
Relationship Analysis of the Proportion of Food Expenditures with Food Security in Farmer Households in North Aceh Regency <i>Riyandhi Praza, Nurasih Shamadiyah</i>	C67

D. Sustainable Resources

Stock and Particulate Organic Matter of Ultisols Under Selected Land Use in Wet Tropical Area, Limau Manis West Sumatra, Indonesia Yulnafatmawita,, Syafrimen Yasin, Zainal A. Haris	D1
Base Analysis and Land Carrying Capacity For the Development of Buffalo in Sijunjung Regency M. Ikhsan Rias, Riza Andesca Putra, Fuad Madarisa	D10
Physical and Mechanical Properties of Pinang (Areca catechu, L.) Iriwad Putri1, Putri Wladari Zainal	D18
Analysis of Food Plants Intercropping on Acidic Dryland Adri, Jumakir, Rustam	D26
Utilization of Organic Material Insitu to Increase the Absorption N, P, K and Soybean Results on Gold Mining Fields in Sijunjung Districts Giska Oktabrina. S., Riza Syofiani.....	D34
Amelioration of the Land of Former Gold Mine By Providing Kirinyuh Weeds and Agricultural Waste to Increase Paddy Production in Sijunjung Regency Riza Syofiani.....	D41

Improvement of Local Bungo Cattle Calving Rate With Artificial Insemination

Bustami, Zubir, E. Susilawati dan Sari Yanti Hayanti

Balai Pengkajian Teknologi Pertanian Jambi

Abstract. An assessment has been carried out to improve the reproduction of local cattle through the activity of assisting the special effort of pregnant cows (SIWAB) in Bungo District in February to November 2018. limited feed in the grazing field so that calving intervals of 18 months to 24 months, it is very necessary reproduction of parent cows. The study was conducted on 40 productive cattles consisting of, First (I) 20 cattles with treatment (a) Provision of natural grass feed in an adlibitum in a cage, (b) Introduction Artificial insemination. Second (II) 20 Parent which is kept by farmers intensively. After pregnancy testing (PKB) was carried out in October 2018, the breeders (I) had pregnancy as many as 13 (65%) born in January to March 2019. Whereas the breeders in breeders (II) who experienced pregnancy only 6 animals (6) 30%). Before conducting the assessment, training is conducted so that farmers understand the purpose of improving the reproduction of breeding cows and improving the maintenance system.

INTRODUCTION

Food is a basic human basic need whose fulfillment is part of the basic rights of every Indonesian people. When viewed from the source of origin, food consists of plant food (plant origin) and animal food (origin livestock and fish). Facing these challenges, the government arranged a program to increase beef/buffalo production by establishing a Special Efforts for Obligatory Breeding Cattle (Upsus Siwab).

The slow growth of cattle population, in general, is caused by the lack of optimal management of reproduction at the farmer level, and the decline in livestock performance. Non-optimal reproduction management has implications for the number of repetitive Artificial Insemination (AI) events so that the calving rate is increased. In addition, there is still much breeding in semi-intensive and extensive maintenance systems, so that the decline in cattle productivity. (Ministry of Agriculture 2019) In addition to the increasingly limited feed sources, it is challenging to develop cattle in open land due to the erosion of grazing fields by oil palm plantations.

Because of the above information, efforts are needed to improve the livestock raising system, through the introduction of feeding and Artificial insemination,

Table 1. Target of IB, Pregnancy and Birth of Jambi Province by Regency / City in 2018

No	District	IB	Pregnant	Partus
1	Batanghari	1.362	1.035	885
2	Bungo	2.476	1.885	1.570
3	Kerinci	2.369	1.800	1.500
4	Kota Jambi	264	200	168
5	Merangin	1.651	1.265	1.048
6	Muaro Jambi	867	660	550
7	Sarolangun	1.065	800	680
8	Sungai Penuh	743	570	470
9	Tanjab Barat	1.238	945	785
10	Tanjab Timur	1.651	1.250	1.050
11	Tebo	2.064	1.575	1.310
	Total	15.750	11.985	9996

Source: Department of Agriculture, Animal Husbandry and Animal Health 2018.

Special Efforts for Obligatory Breeding Cattle (Upsus Siwab) is a national movement as a continuation of previous years' activities to encourage the growth of beef cattle births further in Indonesia. The basis for the implementation of Upsus Siwab is Minister of Agriculture Regulation No.48 / Permentan / PK.210 / 10/2016 concerning Special Efforts to Accelerate the Increased Population of Bovine Cattle and Buffaloes.

Upsus Siwab is a program designed to answer the challenge of increasing ruminant meat consumption by 18.2% from 4.4 grams/cap / day in 2012 to 5.2 grams/cap / day in 2017 while the average local beef supply only meets 65.24% of the total national needs. Activities undertaken to support the program are (1) implementing IB activities and introducing IBs; (2) handling reproductive disorders; (3) fulfillment of animal feed and concentrate; (4) control of productive females. And (5) Monitoring, Evaluation, and Reporting.

The field of reproduction plays a crucial role in efforts to increase beef cattle populations. The target program for compulsory mother cows (SIWAP) will only be achieved if the cattle's reproductive performance is optimal. Factors that cause a decrease in reproductive performance can be grouped into 2 major groups, namely genetic and environmental. If individual livestock from a population come from different locations and offspring, it can be ensured that the low reproductive performance of the population. The feed is an environmental factor that has a significant role in influencing reproductive and physiological functions. Mozes (1998)

The fifth position of beef cattle population per province in Indonesia, according to data from the Directorate General of Animal Husbandry and Animal Health (2013) in East Java province with the largest population of 5,058,853 heads, followed by Central Java province of 2,092,436 cattle, followed by South Sulawesi of 1,152,053 cattle, the fourth-highest was West Nusa Tenggara province with 1,002,503 cattle and finally Jambi province with 834,154 cattle.

A. Food Security

In 2012, the population of large livestock experienced an increase in the population when compared to the population in 2011, with details of beef cattle increasing by 7.80%; dairy cattle increased 2.47%; buffalo increased 10.21%, and horses increased 7.03%. Cattle are one of the leading commodities in the province of Jambi. In 2010 the population of cattle in the whole Province of Jambi only reached 391,846 heads. The population rate continues to increase from year to year so that in 2014 the population of cattle in Jambi Province has reached 742,776 head (Disnak-Keswan Jambi, 2014).

From these data, it is hoped that Jambi Province will become one of the supports for fulfilling local meat availability with an increase in population. This increase in population is also intended to reduce dependence on imports and, at the same time, support Indonesia to become the World Food Barn. In addition to realizing the independence of livestock origin food and improving the welfare of farmers as well as the pursuit of self-sufficiency in cattle in 2026. It is important to optimize the utilization of local resources and the active role of all parties, including the community, in order to achieve these goals.

The structure of livestock business in Indonesia to date has been dominated by smallholder farms with minimal application of technology, for this reason, intervention from the Central Government and Regional Governments is needed in order to provide optimal recognition and services to the community in the application of technology (Director General of PKH, 2017).

One of the government's interventions was the launching of activity in the form of a Special Effort for Obligatory Parent Cows (Upsus Siwab). Upsus Siwab is an integrated activity in order to accelerate the massive and simultaneous increase in the population of cattle and buffaloes, through a reproductive management system approach consisting of the following elements: (a) examination of reproductive status and reproductive disorders, (b) artificial insemination services (IB) and natural mating, (c) fulfillment of frozen semen and liquid nitrogen, (d) control of productive cattle/buffalo slaughtering, and (e) fulfillment of animal feed and concentrates.

Food plays an important role in the general development of the body and reproduction. The effect of food on animal reproduction is regulated through the endocrine system. Lack of energy or nutrients can cause a decrease in certain hormones. This can be corrected by adding hormones or repairing food. Weaknesses or strengths in feeding animals have an adverse effect. In overweight female cattle, egg cells often experience fat tissue infiltration so as to prevent egg growth and release (Tillman et al., 1998).

RELATED RESEARCH / ASSESSMENT RESULTS

Management systems that must be considered for the increasing population are: (a) checking reproductive status and reproductive disorders, (b) artificial insemination (IB) and natural mating services, and (c) fulfilling animal feed and concentrates.

Efforts to increase population in support of Upsus Siwab have been carried out by Balitbangtan through research centers. The research technology packages produced by Balitnak include food technology and reproduction technology packages. The feed technology package support from Balitnak consists of a. Technology package to improve and maintain SKT and reproductive status, b. Technology package to prevent death and increase calf body weight, and c. Technology package to improve the quality of male cement.

Technology package to improve and maintain SKT and reproductive status in the form of 1). Kalem additive feed (Calcium fat) is given every day as an energy source, thereby increasing body weight, 2). Feed additives Probiotic Bioplus fiber is given once / at the beginning of the dry season or 2 months before the mother gives birth and increases feed efficiency and weight, 3). Minoxvit additive feed is given every day, (improves the parent's reproductive status), 4). Zn-Biocomplex additive feed, given daily (can increase parent reproduction) and 5). Application of Biological Clock Technique, namely: supplementation of legumes for 4 months (gestational age 8 months to 2 months after giving birth), administration of fiber Bioplus at 8 months of gestation will produce calves with good birth weight, reduce loss of body weight after delivery, and speeding up estrus after birth.

The technology package to prevent death and increase calf body weight includes 1). Bioplus calf additive feed additive, given once on calf age 30 days: can accelerate the calf's ability to consume forage, improve health, and increase calf body weight and 2). Feed additives Kalem (calcium fat), given daily as an energy source, can increase calf PBBH. Whereas the technology package to improve the quality of male semen is the Minoxvit additive feed, given daily, it can improve sperm quality (number of living sperm, motility, reduce the number of sperm dying when making frozen semen).

The reproductive technology packages of the Balitnak that support Upsus Siwab are 1). Nano prostaglandin hormone technology for estrus synchronization, 2). Synchronization of estrus and ovulation with IB is scheduled in buffalo, 3). Artificial Insemination uses spermatozoa X and Y to get the expected sex of the child and 4). Spermatozoa microencapsulation to overcome problems related to IB time too early. In addition, there are a number of location-specific animal feed technologies.

RESULT

Data on the realization of Siwab Jambi Province

Based on the targets agreed in the March 2018 coordination meeting and the data entered by ISHIKNAS. Can be seen in table 5.

Table. 2 Realization of SIWAB Jaesember 2018

Month	Artificial Insemination (AI)			Pregnant			Partus		
	Target	Realitasion	%	Target	Realitasion	%	Target	Realitasion	%
Januari	945	1636	173	1489	533	36	794	374	47
Februari	945	1594	168	1125	686	61	536	582	108

A. Food Security

Maret	1103	1994	180	662	1201	181	309	988	320
April	1103	1766	160	662	1120	170	718	541	75
Mei	1260	1694	134	772	1341	173	1060	735	69
Juni	945	1103	116	772	654	85	1243	255	20
Juli	1574	2014	104	8Rel	1752	99	1339	874	63
				ated					
				Rese					
				arch					
				/					
				Asse					
				ssme					
				nt					
				Resu					
				lts					
Agustus	1574	2076	132	82	1204	182	1191	651	55
September	2048	2532	124	662	1524	138	900	895	99
Oktober	1890	2514	133	1103	1884	171	660	862	131
Nopember	1260	2008	153	1103	1818	182	660	1162	139
Desember	1103	1074	97	1432	539	41	531	481	91
				1321					
Total	15750	19619	1258	11985	11899	118	9996	6757	68

Source: Department of Agriculture and Animal Husbandry Prop. Jambi and Data that enter ISHIKNAS until July

The results of the introduction of Artificial Insemination

Table 3. Parent ownership data, IB performance (PK)

No	Breeders	Cattle population	Weigh of cattle (kg)	Day of AI	PKB result in October 2018
1	Ita	3	148 (local)	26 April	(-) Bali
			174 (local)	20 April	(-) Bali
			164 (local)	17 April	(+)Bali
2	Sarifudin	2	269 (Bali)	19 April	(+) Simenthal
			182 (local)	24 April	(+) Bali
3	Hirwansyah	2	261 (Bali)	17 April	(-) Bali
			257 (Bali)	19 April	(-) Bali
4	Jawarni	1	213 (local)	24 April	(-) Bali
5	Aan	1	207 (local)	10 April	(+) Bali
6	Syahroni	1	183 (local)	25 April	(+) Bali
7	Mamat	1	187 (local)	Juli	(+)Bali
8	Masri	1	201 (local)	Mei	(-) Bali
9	Sofia	1	264 (Bali)	24 April	(+) Bali
10	Hendri	1	193 (local)	11 april	(+) Bali
11	Julis	1	208 (local)	17 April	
				15 Mei	(+) Bali
12	Saprudin	1	207 (local)	11 April	(+) Bali
13	Buyung	1	176 (local)	17 April	(-) Bali
14	Aji Daud	1	183 (local)	10 April	(+) Bali
15	Abdullah	1	192 (local)	12 April	(+) Bali

A. Food Security

16	Latif	1	215 (local)	21 Juli	(+) Bali
	Pregnant Total				13 ekor
	Persentase				65 %

Implementation of assistance in the districts of Bungo and Tanjung Jabung Timur, which was followed by relevant agencies, namely training in health services

Table 4. Assistance data in two districts

No	Description	Bungo District	Tanjabtim District
1	Training	2	-
2	Health services	2	1
3	checked cattle (tail)	450	252
4	Snapping passion (tail)	40	21
5	Artificial Insemination	45	12
6	(tail)	a. BPTP Jambi	a. BPTP Jambi
	Agency involved	b. Livestock Services of Province	b. Dinas Pet.TK I
		c. Livestock Service of District	c. Dinas Pet.TK II
		d. BPTU Padangmangatas	
		e. BBVET Bukittinggi	

Table 5. Training materials in UPTD Teluk Pandand agriculture

No	Training materials	Interviewees	Institutions
1	Kebijakan SIWAB	Herpa.	Livestock Services of Province
2	Progran Disnak Kab.Bungo	Spt.MSi.	Livestock Service of District
3	Teknologi IB	Enggar.	BVET Bukittinggi
4	Pengembangan Hijauan Pakan	Spt.MSi	BPTU Padangmangatas
5	Ternak	Drh.Ibnu	Keswan Prop.
6	Penanggulangan Gangrep	Drh.Julianto	BPTP jambi
7	Pengelolaan Limbah ternak	Ir. Bustami	Head of UPTD, Land of
	Peran Penyuluh dlm UPSUS Siwab	Sujak	Sepenggal

DISCUSSION

Based on table 2. the Realization of artificial insemination (IB) exceeds the agreed target, and this means that the IB program gets a reasonably good response in the farming community, as well as pregnancy inspection (PKB) exceeds the agreed target. It is also proving that the artificial insemination program (AI) is sufficiently understood by farmers to challenge the stages of the IB program. While the birth realization is still below the target, this proves that there are still many farmers who have not reported births, so the birth realization should be almost the same as the pregnancy realization rate. This is likely due to IB and PKB reporting systems through ISHIKNAS getting incentives while birth reporting has not been done. Starting in 2019 there are incentives for reporting births.

Furthermore, based on table 3, the demonstration plot data for 20 productive cows that have a pregnancy delay of at least 4 months, carried out observation of estrus, in case of estrus there will be artificial insemination (IB), so that in June 2018 as many as 20 cattle have been inseminated in Create (IB), Observations continue

during the next estrus period. Ie as much as 2 cattle, then the second IB. Implementing IB, namely in May 2018 to determine the success of IB (pregnant) PKB required in October 2018.

In carrying out the assistance is in collaboration with the Padang Mengatas Superior Livestock Breeding Center, Bukittinggi Veterinary Office and the Animal Husbandry Office TK I and II (table.3). The activities carried out are Carrying out Health Services for cattle, rectal palpation to determine the reproductive status (pregnant, lust and not pregnant) if lust is found then Artificial Insemination (IB) will be carried out if found mature follicles are almost done bluffing while those that are not yet pregnant with Empty status reproduction is done by giving vitamins and stimulating the growth of follicles. The location of assistance in East Tanjab district is Sadu sub-district, Air Hitam Laut village, Sungai Sayang, and Remau is standardized. Meanwhile, Bungo Regency is Tanah Sepenggal and Bathin Tigo, namely villages. Pandak Bay, Embacang gedang, lubuk Benteng, and Long Bay. As for the number of animals examined, there is table 3.

Carry out livestock health services

The implementation of cattle health service activities is only Bungo district, namely in the villages of Embacang Gedang, Lubuk Benteng, and Pandak bay village. Together with animal husbandry inspection assistance, which is administering vitamins, treating wounds, and administering worm medicines. Livestock health services for demonstration plot cooperative members are carried out at any time through health workers working with BPTP.

Conducting training for one day, which was attended by 60 farmers and field officers. Coming from 3 three villages, namely Embacang Gedang, Lubuk Benteng, and Pandak bay village.

CONCLUSIONS AND SUGGESTIONS

With the implementation of activities from February to November 2018, the implementation carried out was socialization at the central, provincial, and district levels. Communication between IB officers, Field agriculture instructors, and breeders has not run optimally, but the cooperator breeders have been running communication. The results of artificial insemination (IB) of 20 cattle after pregnancy examination revealed 13 pregnant birds (65%). It can shorten the birth distance of 14 to 18 months. The knowledge of breeders about the characteristics of estrus is still not maximal. The number of livestock is examined as many as 702 productive head. Activities are carried out in collaboration with the superior breeding farms in Padang, the Bukittinggi Veterinary Office and the Provincial Kindergarten Livestock Service Office and the District Livestock Services Office.

The implementation of the Siwab upsus activity in Bungo is carried out artificial insemination at the mentoring location, namely the village of Pandand Bay in April to June 2018, which was expected to be born in January to March 2019 to

require further assistance one month before and after birth. So it requires special attention so that children can get alive.

PERFORMANCE ASSESSMENT RESULTS

Activities SIWAB special efforts are carried out in two districts namely Bungo Regency and Tanjung Jabung Timur Regency in accordance with the Decree of the Minister of Agriculture No, Number 48 / Permentan / PK.210 / 10/2016 and Permentan Number 8933 / Kpts / OT.050 / F / 12/2016, BPTP Balitbangtan Jambi is one of the supervision team. The results of the activity are the implementation of Artificial Insemination, which is produced in 20 cattle that have problems with delay in birth. The cattle is applied by providing optimal basal feed (adlibitum) during feeding. All breeders have esterus so that Artificial Insemination (IB) can be carried out, after observing after optimal three months in the IB conducted a PKB with a success of 13 positive pregnant cattle (65%). Which is expected to be born January to March 2019.

REFERENCES

- BPTP Jambi. 2014. Laporan Hasil Penelitian TA. 2013. Balai Pengkajian Teknologi Pertanian Jambi.
- Dinas Pertanian Peternakan dan Kesehatan Hewan Propinsi Jambi, 2018. Laporan Tahunan 2017.
- Jambi dalam angka 2016. BPS jambi 2017
- Kearl, L. C. 1982. Nutrient Requirements of Ruminants in Developing Countries. International Feedstuffs Institute, Utah State University, Logan.