PRIMA SCALA-MEDI

PRIMA SCALA-MEDI NEWSLETTER AUGUST 2022- ISSUE 02

IMPROVING SUSTAINABILITY AND QUALITY OF SHEEP AND CHICKEN PRODUCTION BY LEVERAGING THE ADAPTATION POTENTIAL OF LOCAL BREEDS IN THE MEDITERRANEAN AREA.

EDITORIAL

Dear Readers,
It is our pleasure to share the second issue of the SCALA-MEDI Newsletter with you. In this issue, we provide you with a brief description of the project progress from April to September 2022. We also introduce our Moroccan team. In addition we share some events which are of interest and provide a reading suggestion that will allow our readers become more familiar with the topics of SCALA-MEDI. We wish you pleasant reading. Please feel free to share this newsletter with your network.

SCALA-MEDI PROGRESS

Validation of remote phenotyping

SCALA-MEDI is testing an innovative phenotyping system of "Animal Buttons" which consist of small sensors (Figure 1) that measure movement, animal temperature (surface and sub-cutaneous) and pulse oximetry.

For sheep, the accelerometer needs to be placed on the leg (Figures 2).

The skin temperature sensors are placed the neck of the animal together with an AnimalTalker, which collects the data and transmits it to a central data base for storage. In addition to skin temperature there are Animal Buttons to record movement and environmental data, such as temperature and humidity, which are collected hourly, stored in the AnimalTalker. then transmitted to a central data base.

How does the system work? To extend battery life the AnimalTalker device has a sleep mode, such that every 90s, it is activated to collect accelerometric data for 5s, then returns to sleep mode. For the last 3 minutes of each hour, the device records the Global Navigation Satellite System position (GNSS) and synchronizes with the Network Time Protocol (NTP). Data received by the Animal Talker are sent to a server through Narrowband Internet of Things technology (NB-IoT technology); which is a radio communication protocol.
The sensor system for sheep has recently been tested by our Sardinia partner AGRIS. Various data collected by the Animal Buttons have been successfully received on the server. Sensors will be validated on chicken soon and will be distributed to our North-African partners to be tested in the field.
More news will be available in next newsletter issues, stay tuned…!

Questionnaires and sampling in the field

All North African partners have collected animal phenotypes, blood samples and farm data.

A. INAT Tunisia

Our Tunisian partner collected data on animals from private veterinarians and on consumer preferences using online questionnaires. In addition, sheep surveys were carried out in the field with breeders providing information on farming systems, while SCALA MEDI researchers collected phenotypic measurements as well as blood samples. Data have been collected for four local Tunisian sheep breeds; namely Queue Fine de l'Ouest, Sicilo-Sarde, Noire de Thibar and Barbarine.

B. INRA Morocco

Our Moroccan partner has started collecting data from Beldi chicken and local sheep breeds. Beldi chicken breeders of the central region of Morocco were targeted and data were collected from points of sale, veterinarians and consumers.

Sheep, breeders in several regions of Morocco (Tadla, Erhamna, Errachidia and Oriental) have been visited and phenotypic data and blood samples have been collected.

Socio-economic data have also been collected in Morocco from points of sale, consumers, veterinarians and decision makers using questionnaires.

C. Algerian partners

Our Algerian partners have collected data from veterinarians, consumers and points of sale in the western Algerian region.

Information has been collected during field visits to chicken breeders and blood samples were collected from different regions (Souk Ahres region, Tlemcen, Bechar, Naama, Setif, Sidi Bel Abbes, Oran,

Mascara, Relizane, Mostaganem, Tiaret and Chlef).

Sheep breeders were also visited, and phenotypic measurements and blood samples have been taken from animals of two local sheep breed (D'men, Sidaoun).

Information from consumers, veterinarians and decision-makers in Tlemcen, Saida and M'sila regions has been collected using questionnaires.

SCALA-MEDI summer school

The annual project meeting, together with a summer school on genomic was organized by The Università Cattolica del Sacro Cuore (UNICATT) from the 12 to 14 September 2022. Both the meeting and Summer School were attended in person for those able to attend, and were also accessed on-line.

The scientific program of the summer school was presented by visiting guest speakers and included lectures on Trends in Genomics, Measuring biodiversity with genomics, Selection signatures and landscape genomics, genome-wide association studies (GWAS), conservation genetics and breeding with genomics. An afternoon practical session introduced partners to the use of several software packages used in the study of animal biodiversity.

All lectures presented at the summer school were recorded and are now available on SCALA-MEDI website (www.scala-medi.eu).

SPOTLOGHT ON PARTNERS

We are happy introduce you to our Moroccan partners

The Animal genomics research laboratory – INRA

The Laboratory of Animal Genomics at INRA TADLA was founded in 2021. It is supervised by Dr. Badr Benjelloun and carries out research on animal genomics, focusing on local sheep and chicken breeds. The mission of the laboratory is to provide molecular biology-based services to enhance animal health, welfare, and productivity to improve sustainability and quality for livestock producers. More information can be found on the lab website:

https://www.inra.org.ma

The National Institute of Agricultural Research - INRA

The National Institute of Agricultural Research "INRA" is a public establishment founded in 1914 with the aim of undertaking research for the agricultural development. INRA operates through ten regional agricultural research centers and twenty-three experimental units spread over the national territory. INRA collaborates with national and international organizations, development structures, the private sector, and non-governmental organizations.

Moroccan Poultry Federation (FISA)

The Moroccan Poultry Federation "FISA" is a professional organization specialized in the poultry sector. FISA aims to develop the capacity of the poultry sector to produce and market quality products at competitive prices that are accessible to

consumers. The federation works to:

- Improve the technical and economic environment for the production and marketing of the poultry products.

-Ensure the sustainable development of the poultry sector.

-Inform, educate and coach poultry operators.

-Promote communication on the quality and consumption of poultry products.

We invite you to visit the federation website to find out more about FISA:

www.fisamaroc.org.ma

Association Nationale Ovine et Caprine (ANOC)

The National Sheep and Goat Association 'ANOC' is a non-profit association, created in 1967, first under the name of AEROPESAM (Association of Breeders of Pure and Selected Sheep Breeds in Morocco) then restructured in 1980 to become the ANOC (National Sheep and Goat Association). The association was created to improve production and for selection of parents of proven productive quality. The main mission of the association is to improve the income of the sheep and goat breeder.

The website of the association provides more information about ANOC:
www.anoc.ma

Association Nationale
Ovine et Caprine

ANOC

About the Moroccan Team

Dr. Badr BENJELLOUN

Dr. Badr Benjelloun graduated as an Engineer in Livestock Production and has a PhD in Biodiversity, Ecology and Environment from the University of Grenoble Alpes in France. He is a Research Scientist in Livestock Genomics at INRA and has been a visiting scientist at Laboratoire d'Ecologie Alpine, CNRS/UGA since France since 2015. He has 15 years of research experience in livestock genetics.
Dr. Badr Benjelloun is involved in many national and international projects including NextGen, IMAGE, and the VarGoats.
His area of expertise focuses on genome diversity and the bases of local adaptation using whole genome sequence (WGS) data in small ruminants. His is interested in the application of various Omics technologies for sustainable breeding schemes of local livestock.
He has led one of the 10 INRA regional centers in Morocco (CRRA of Tadla) since September 2020.

Dr. Hayat Lionboui

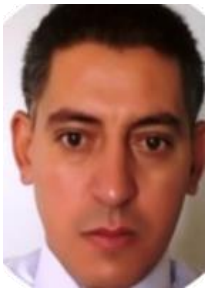
Dr. Hayat Lionboui is a research scientist in Environmental economics at INRA in the Department of Economy and Rural Sociology.
She graduated as an engineer in Agricultural economics and has a PhD in Environmental sciences and Environmental economics.
Dr. Hayat Lionboui is currently monitoring and managing of natural resources and vegetation cover using agro-economic modeling and efficiency analysis.

Dr. Abdelmajid Bechchari

Dr. Abdelmajid has been a researcher at the National Institute of Agronomic Research, Regional Center of Oujda – Morocco since 1993 with a focus on pastoralism and livestock production on rangelands. ***H***e graduated as an engineer in Agronomy, specialized in Animal Productions and accomplished a PhD in Agronomic Sciences.

His main interest is livestock and production systems in the context of resources and pastoral communities. He works with users, in the development of management plans and strategies.

Dr. Mustapha Ibnelbachyr



Dr. Mustapha obtained a M.S. degree in Animal Production from the Agricultural National School (Meknès, Morocco) and a Ph.D. in agronomic and veterinary sciences from Hassan II Agronomic and Veterinary Institute (Rabat, Morocco).
He works at the Institut National de la Recherche Agronomique (INRA) of Morocco in the Regional Centre of Errachidia, on small ruminant genetics, reproduction and evaluation, and has a particular interest in the indigenous Drâa goat and D'man sheep breeds.
He was member of other consortia, e.g.the IMAGE project (Innovative Management of Animal Genetic Resources) and NextGen project.

Dr. Bouchra El Amiri

Dr. Bouchra is a researcher at the National Institute of Agronomic Research (INRA), Regional Center of Settat-Morocco.
She graduated from the Hassan II Agronomy and Veterinary Medicine Institute of Rabat in December 1992 with an engineering diploma in Animal production science. She completed a Master degree in November 1999 and a PhD in April 2003 majoring in Reproduction Physiology at the Faculty of Veterinary Medicine, Liège university, Belgium.
She joined the INRA-Regional Center of Meknès, Morocco in March 1995. In 2003, she joined the Regional Center of INRA-Settat, Morocco as Maître of research, became Director of research in 2013. Since 2007, she has lectured at the Faculty of Science and Techniques in Settat and recently (2016) at Hassan II Agronomy and Veterinary Medicine Institute of Rabat.
Her main areas of research are early pregnancy-diagnosis and assisted reproduction techniques. She is reviewer for three international journals and for the National Scientific and Technique Center (CNRST). She was the recipient of the Grand Prix Hassan-II prize in 2004 in recognition of her outstanding research work in the area of biochemistry and the development of new radio-immuno assays for early pregnancy diagnosis.

Dr. Safae Simma

Dr Simma is a Phd student in the laboratory of biodiversity, ecology and genome, faculty of sciences, Mohamed V university, Rabat, Morocco.

She holds a master's degree in biotechnology from Mohamed V university.

Her thesis subject revolves around the conception of a sustainable selection system for the Sardi sheep breed in Morocco. The project work is carried out in the laboratory of livestock genomics at the regional center of agronomical research of Tadla, Morocco.

INTERESTING EVENTS

1st IW-VMAB2022, International Webinar on the Valorization and Management of Animal Biodiversity), 01 and 02 June 2022, ORAN, ALGERIA, (https://lgmc.webnode.fr/).
Prof. Paolo Ajmone Marsan presented a lecture describing the SCALA-MEDI project. Pr Michèle Boichard presented a lecture on the strategies of preservation of the poultry population in France. Pr. Suheil Gaouar also presented a lecture on prion in dromedary Algerian populations.

EAAP (annual meeting of the European Association for Animal Production): 5-8 September 2022, Porto, Portugal (https://meetings.eaap.org/).

Prof. Paolo Ajmone Marsan presented a poster describing the SCALA-MEDI project at this meeting poster You can find the abstract and the poster at the SCALA-MEDI website.

4th USDA Animal Biotech Regulatory Workshop: 12-16 September 2022, State of Sao Paulo, Brazil (https://sites.google.com/a/vt.edu/animal-biotechresources/2020-4th-intl-worksh

SUGGESTED READING

Our readers will be interested in an article published by Gherissi, D.E., Lamraoui, R., Chacha, F. et al. with the title “Accuracy of image analysis for linear zoometric measurements in dromedary camels”, which appeared in the 54th issue of the journal Anim Health Prod 54 (2022). The article is accessible at: https://doi.org/10.1007/s11250-022-03242-3

To summarize, the authors analysed morphometric traits of camels, which are of a great interest when performing a genetic study. The authors explain that morphometric traits reflect the genetic merit of individuals. Investigating the phenotypic variability within a population gives us an idea about its genetic variability. In their study, the authors address the difficulties encountered in measuring morphometric traits in the field, especially when dealing with large aggressive animals. They describe the use of image analysis; a modern non-invasive technique that completely avoids direct contact with the animals, avoids disturbance of the animals, and also speeds up the operation.
The study reported in the paper was designed to verify the effectiveness of the method. They measured body traits; including profile photographs, face and back using the image analysis method which they compared to manual measurements. The analyses of images used Axiovision software. In their conclusion, the authors note good agreement between the methods for linear body measurements in camels leading them to consider the image

analysis method as a valid tool for camel conformation trait studies.

We strongly recommend that you visit our website, where you can find more information about the project.
www.scala-medi.eu.