LEAP-Agri: OPTIBOV-project

Genetic characterization of cattle populations for optimized performance in African ecosystems

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WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

Why OPTIBOV

- Maintain traditional cattle breeds
- Capture genetic and genomic variation
- Use strength of these breed (adaptation)
- Use these breeds to find selective sweeps related to adaptation
- Use known variation in production to improve production (marker assistant selection)
- Train, educate and involve people to perform optimal breeding (longterm investment) (workshops, app, website)

Aim of the project: Adaptation!

- Improve production and survival of traditional breeds adapted to their local environment
  - Select local breeds
  - Collect phenotypes
  - Collect DNA
    - Estimate the amount of inbreeding
    - Find selection signals on the genome
    - Find genes and variant on the genome
    - How to improve adaptation and production

Partners (PI)

- Europe:
  - Prof Dr. J. Kantanen (FI:LUKE)
  - Dr. C. Ginja (PT:CIBIO/ICETA)
  - Dr. R. Crooijmans (NL: WUR) project leader
- Africa:
  - Dr. D. Kuganza (UG:MU-CAES)
  - Dr. M. Makgahlela (ZA:ARC)
  - Dr N. Ghanem (EG:CU)

Breeds

Eastern, northern and western Finn cattle

Groninger Whiteheaded Dutch belted, Tauros

Mirandesa, Barrosã and Mertolenga.

Menofi (Baladi) / Domiaty (Damietta) / Maryuti

Ankole, East African Zebu

Nguni, Drakenberger

Potential traits:

-Climate, amount of rain, ecosystem

- Temperature-humidity index

Availability of water\food

- Food quality
- Amount of food available
- Type of food
- Disease recording
- Disease resistance
- Parasites infections (ticks, nematotes)
- Housing (outdoor-indoor)
- Production records
- Calving interval/total number of calves
- Age of first calf
- Treatments
- Biochemical measurements on blood
- Immune parameters (Ig)
- MHC haplotypes

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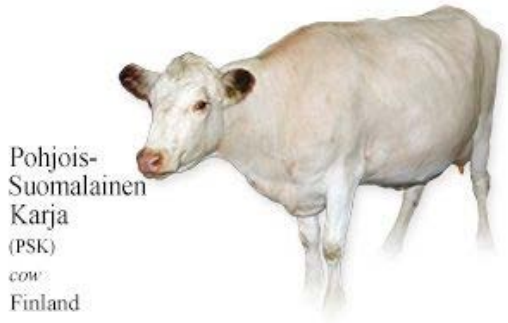
breeds


AFRIKAANSE WEERGAWE
NGUNI
Cattle Breeders' Society | Beestelersgenootskap

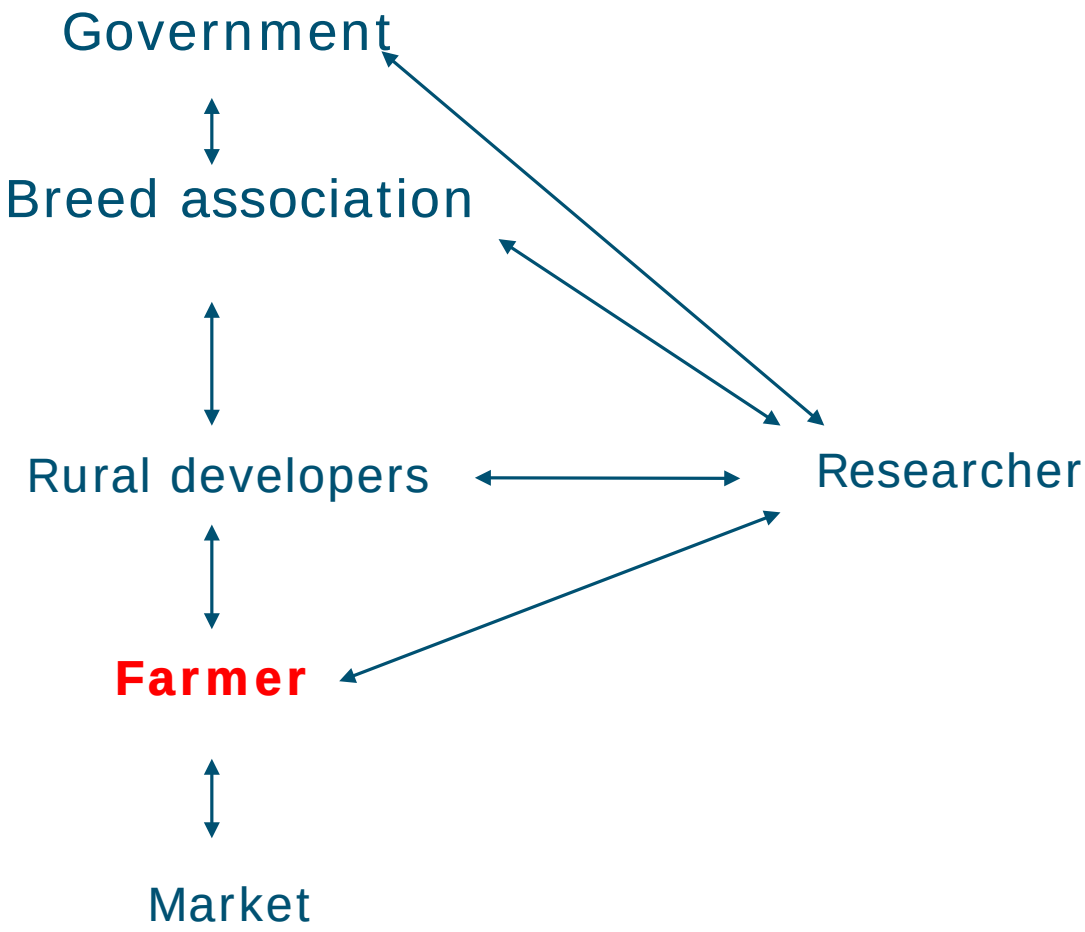

Maryuti
cow
Egypt


Pohjois-
Suomalainen
Karja
(PSK)
cow
Finland

Recording phenotype

- Basis is the FAO list but expanded with new knowledge
- Record what is going wrong
- Easy access
    - App (info/pictures)
    - Website
    - Database

Information/data flow



Outcomes OPTIBOV

- Markers detected for selective adaptation traits
- Phenotype list
- African cattle breed variants
- Traditional/local breed characterisation
- New African SNP array
- Recording system (app, database, website)
- Training schools (phenotype and genotype analysis)

Thanks to

- LEAP Agri
- Local financers