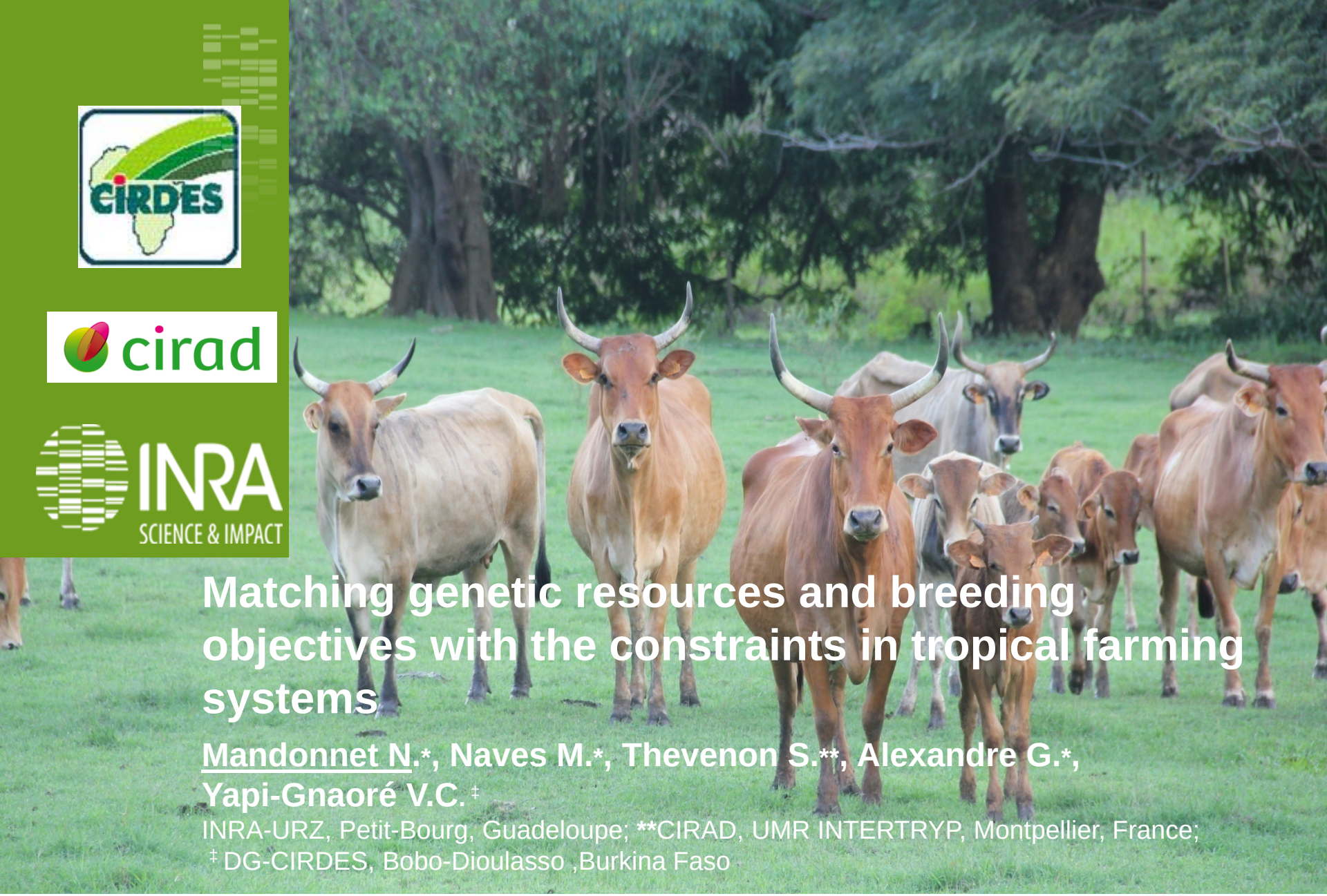


# Matching genetic resources and breeding objectives with the constraints in tropical farming systems

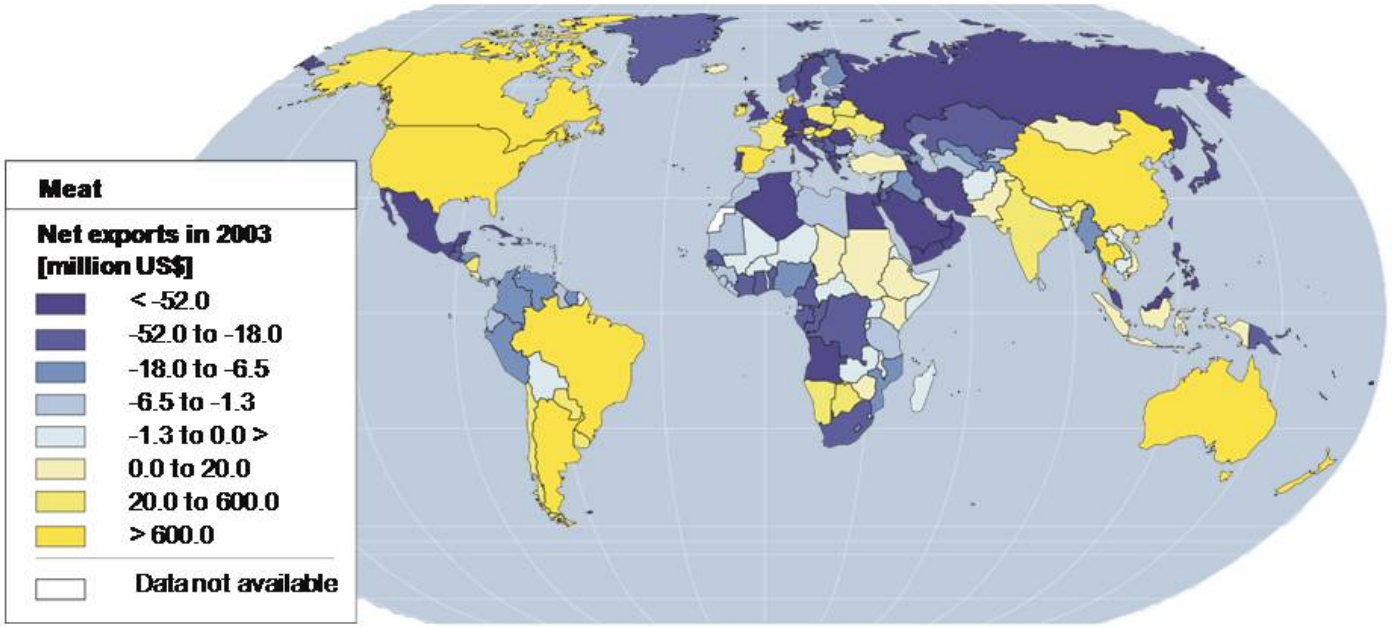
**Mandonnet N.**[*], **Naves M.**[*], **Thevenon S.**[**], **Alexandre G.**[*], **Yapi-Gnaoré V.C.**[‡]

INRA-URZ, Petit-Bourg, Guadeloupe; [**]CIRAD, UMR INTERTRYP, Montpellier, France; [‡] DG-CIRDES, Bobo-Dioulasso ,Burkina Faso

64th EAAP 2013 ANNUAL MEETING OF THE EUROPEAN FEDERATION OF ANIMAL SCIENCE
AUGUST 26TH - 30TH, 2013
NANTES, FRANCE

# Dissatisfaction in animal products coverage in the tropics

Net exports – meat




*Source*:
FAOSTAT.

# Which ways to increase livestock productivity in the tropics?

- **Import of exotic breeds:** Some success stories (in large population)… in which local breeds conservation is part of the program

BAIF DEVELOPMENT RESEARCH FOUNDATION

... Committed to Sustainable Development in Rural India

BAIF Bhavan, Dr. Manibhai Desai Nagar, Warje, Pune 411058, India

promoting/organising crossbreeding
between Holstein and Jersey bulls
and Gir Zebus and Jaffarabadi Buffalo cows

ITC

International Trypanotolerance Centre
Banjul, The Gambia, West Africa

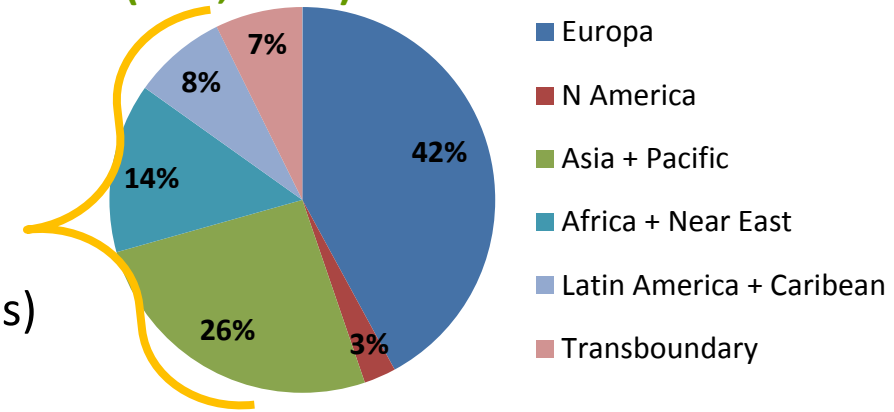
Promoting crossbreeding of N'Dama cattle
with exotic dairy breeds

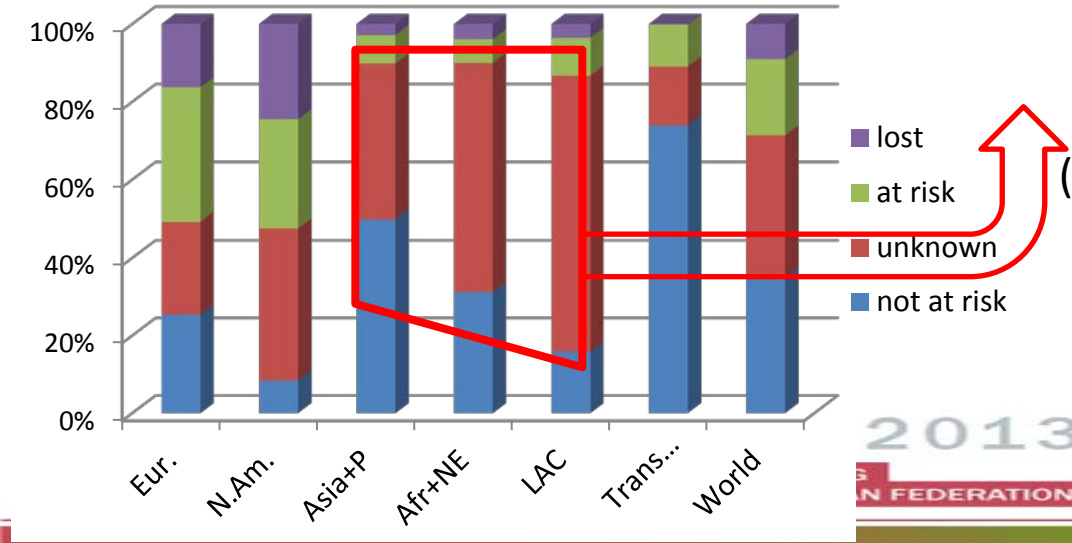
# Which way to increase livestock productivity in the tropics?

- **Import of exotic breeds:** … and a lot of bad experiences without any analysis of failures

## Situation of local and regional breeds (FAO, 2008)

- 48 % of local and regional breeds are present in Asia + Pacific , Africa + Near East, Latin America + Caribean (among 5599 mammals and 2017 avians)




- Risk status is generally unknown (40 to 70 % according to the region)
- Crosses and substitutions with transboundary breeds threaten these endogen resources

# Which ways to increase livestock productivity in the tropics?

- **Preservation and improvement of local breeds**

  In small populations,

  – Favour sustanability through balanced abilities

  – Take into account multipurpose functions of animals and systems

↳Identify the brakes of stakeholders' attachment to their local breeds and adapt the speech

# An experiment in West Africa:
## The Djallonké open nucleus breeding program

**National improvement program** emphasizing on smallholders since 1983 in Côte d'Ivoire

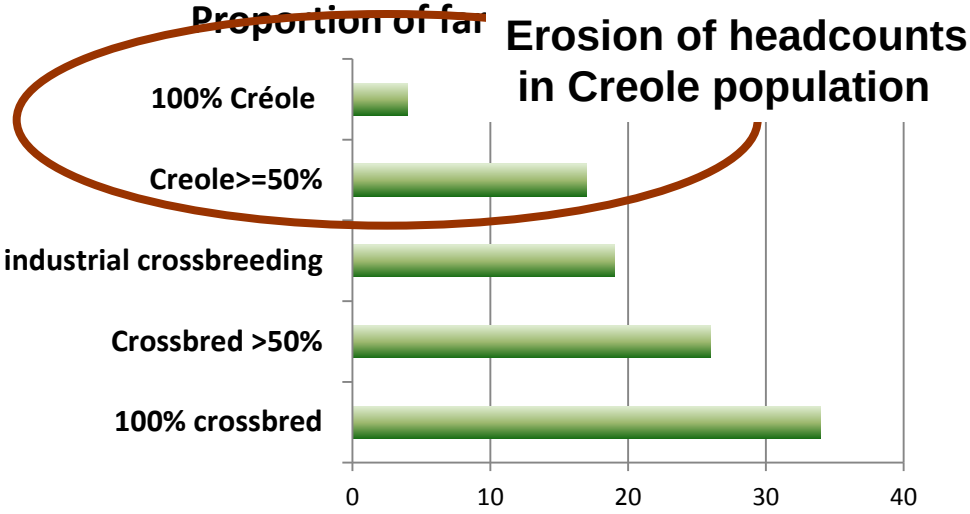
- **Goal :** improvement of growth performances with a focus on the utilization and conservation of the local Djallonké breed

- **Structure:**
  - central performance evaluation station for rams (the nucleus)
  - farmer flocks of breeding ewes only (the base population)

- **Constraints taken indirectly into account**

# An experiment in the caribeans: The Guadeloupean Creole goat

A **participative action** between:
The farmer cooperative
The extension services
INRA researchers




A public extension policy favouring exotic imports

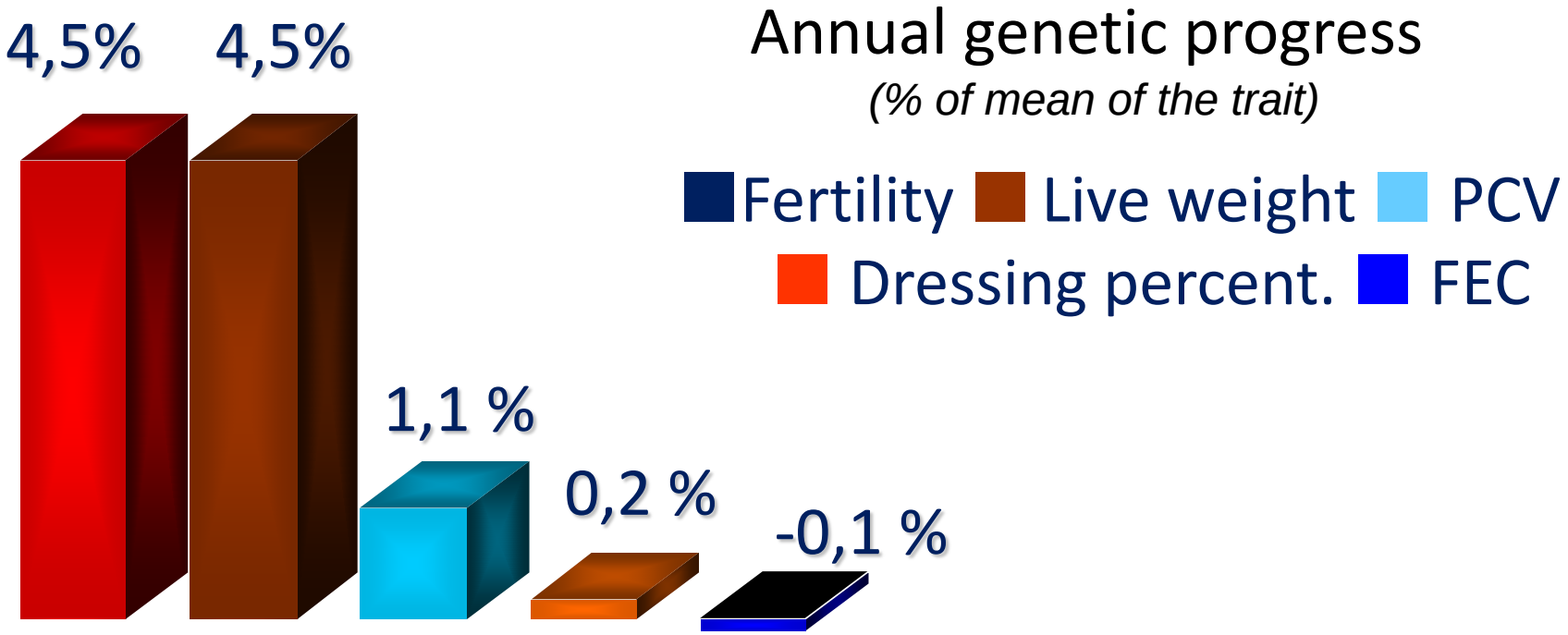
# A 4-point approach

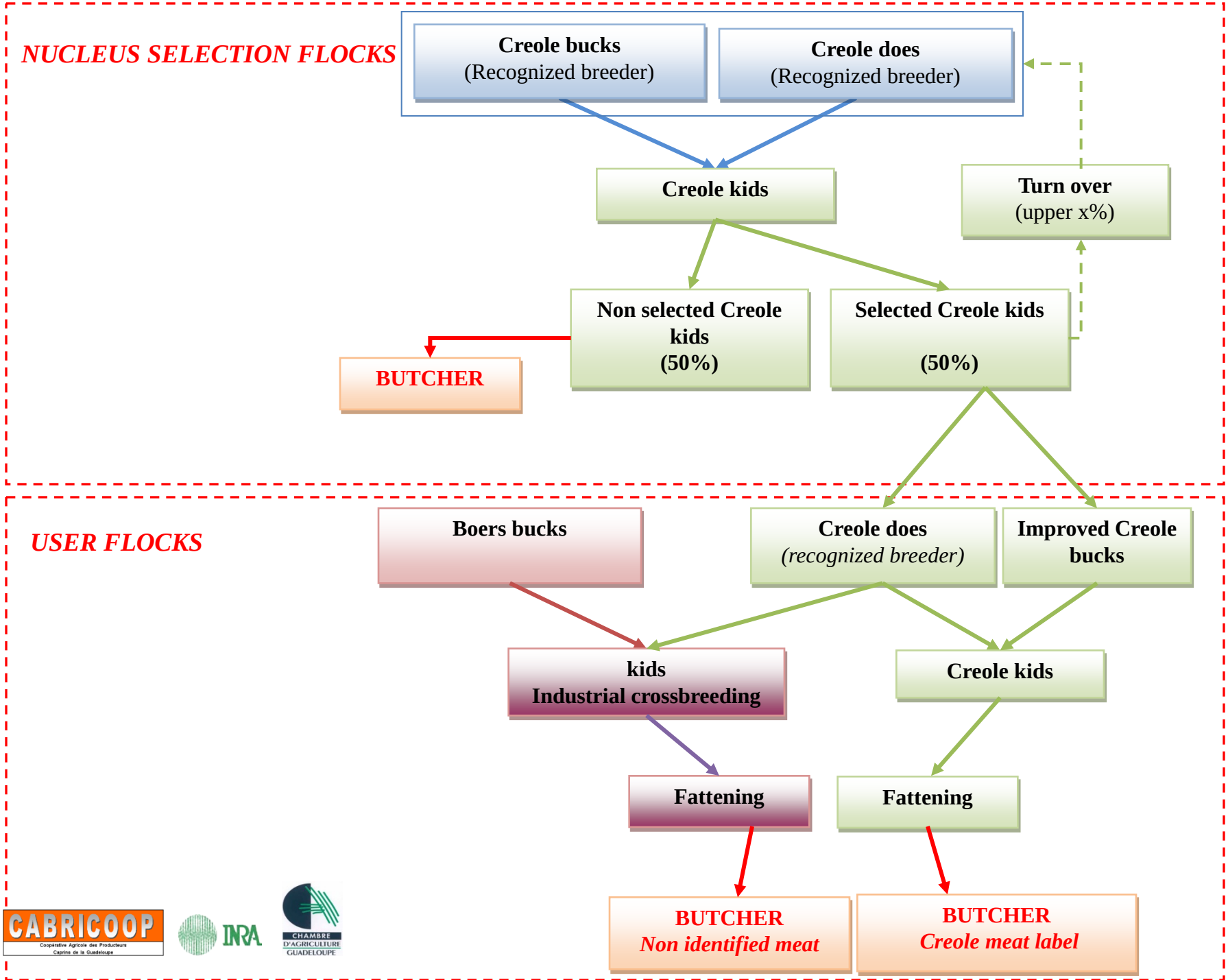
1. **Characterization** of farming systems and farmers' expectations in field surveys (Gau et al, 2000; Gunia, et al 2010)
2. **Identification** of the base population & **estimation** of genetic variability available (Gunia, et al 2011)
3. **Design** of the breeding goal (Gunia, et al 2013a)
4. **Optimization** of the scheme and estimation of genetic progress (Gunia, et al 2013b)

Specific evaluation tools were developed (Standard grid, standardised evaluation design for growth, resistance and resilience traits)

# A balanced animal for diverse breeding systems

## An original production/adaptation breeding goal




NUCLEUS SELECTION FLOCKS
Creole bucks
(Recognized breeder)
Creole does
(Recognized breeder)
Creole kids
Turn over
(upper x%)
Non selected Creole kids
(50%)
Selected Creole kids
(50%)
BUTCHER
USER FLOCKS
Boers bucks
Creole does
(recognized breeder)
Improved Creole bucks
kids
Industrial crossbreeding
Creole kids
Fattening
Fattening
BUTCHER
Non identified meat
BUTCHER
Creole meat label

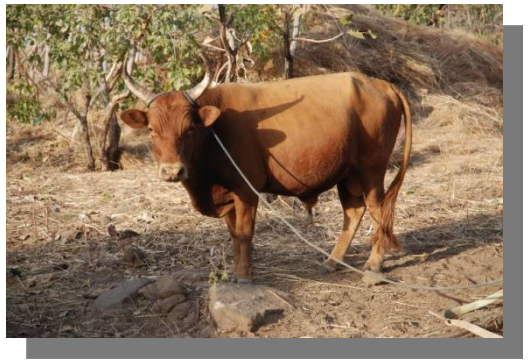
# In the future: prospects of genomic tools

- **GT will help characterisation of local genetic resources** (selection signature, adaptation markers or genes and adaptation mechanisms)
  - but ***need global international projects*** to a comprehensive evaluation of available genetic resources

- **GT may favour genetic improvement** (identification of QTL, genomic selection for diverse traits, less dependant on pedigree structure)
  - but ***depends on availability of informative data*** on local populations and cheaper tools

- **At the moment, GT are unaffordable for most tropical countries** (lack of technical and financial resources)
  - and may ***represent an additional threat***, by increasing commercial aggressiveness of exotic breeds

# Conclusions



- Participative actions
- Supported by an holistic research approach (genetics, systemic, socio-economy, vet. scie…)
  - > to really match genetic resources and breeding objectives with the constraints,
  - > and increase livestock productivity and multifunctionality in tropical farming systems

Ayalew et al (2003), Berthouly et al (2012)…

INRA
SCIENCE & IMPACT

cirad

CIRDES

Funded by

REGION
ARCHIPEL
GUADELOUPE

**Thank you for your attention!**