HAL
open science

Integrated control of goat gastrointestinal parasitism : an example in the humid tropics.

Maurice Mahieu, Rémy R. Arquet, Gisèle Alexandre, Maryline Boval, Jean-Christophe Bambou, Harry Archimède, Carine Marie-Magdeleine, Nathalie Mandonnet

To cite this version:

Maurice Mahieu, Rémy R. Arquet, Gisèle Alexandre, Maryline Boval, Jean-Christophe Bambou, et al.. Integrated control of goat gastrointestinal parasitism : an example in the humid tropics.. 11. International Conference on Goats (ICG), Sep 2012, Gran Canaria, Spain. hal-02806169

HAL Id: hal-02806169

https://hal.inrae.fr/hal-02806169v1

Submitted on 6 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

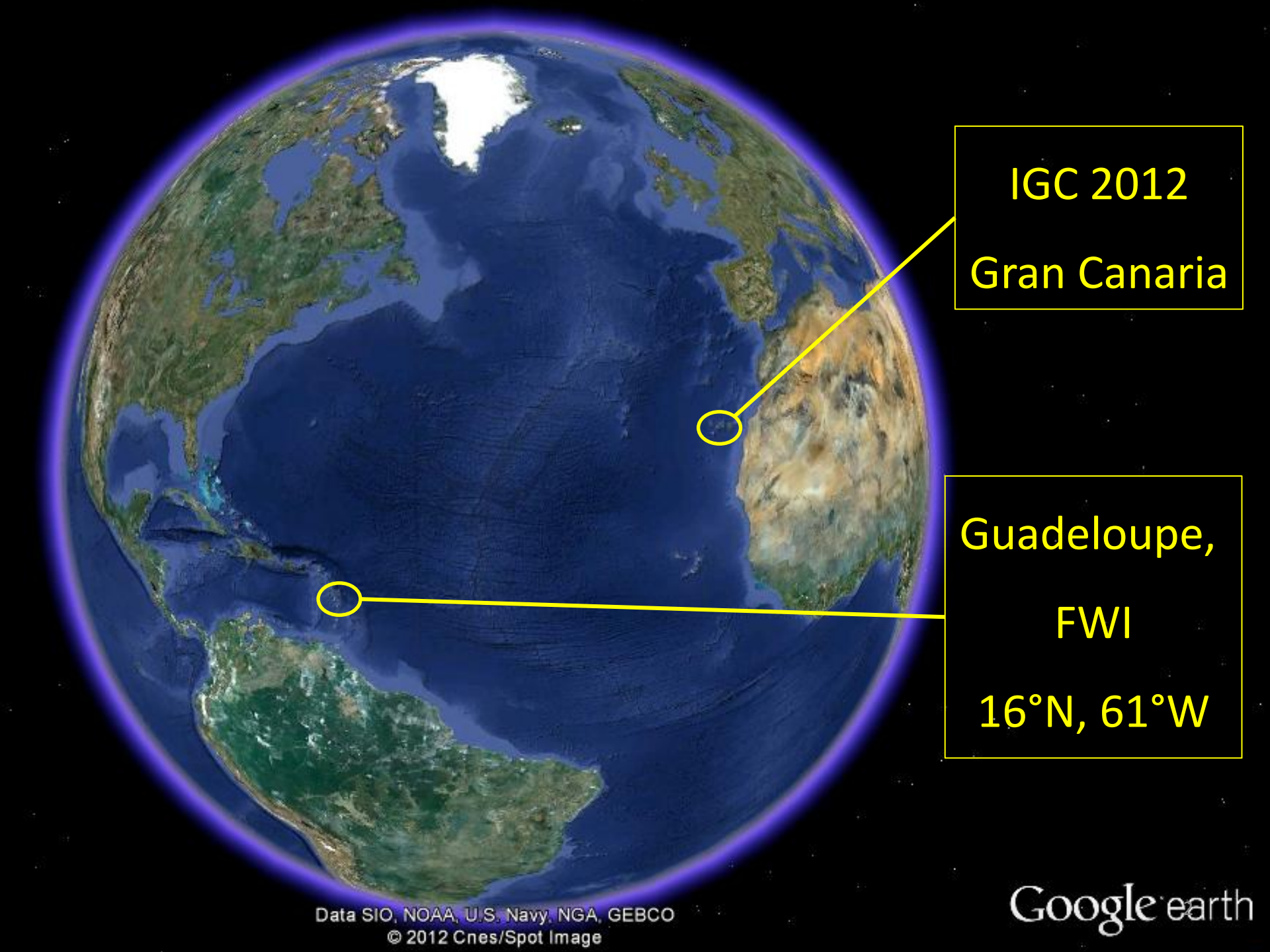
XI International Conference on Goats (ICG 2012), Gran Canaria, Spain

Integrated control of goat gastrointestinal parasitism: an example in the humid tropics

Mahieu, Arquet, Alexandre, Boval, Bambou,

Archimède, Marie-Magdeleine, **Mandonnet**

ALIMENTATION
AGRICULTURE
ENVIRONNEMENT


IGC 2012
Gran Canaria
Guadeloupe,
FWI
16°N, 61°W
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2012 Cnes/Spot Image
Google earth

Gastro-Intestinal Nematodes (GIN) cause heavy losses to goat industry, up to 50% of the production potential

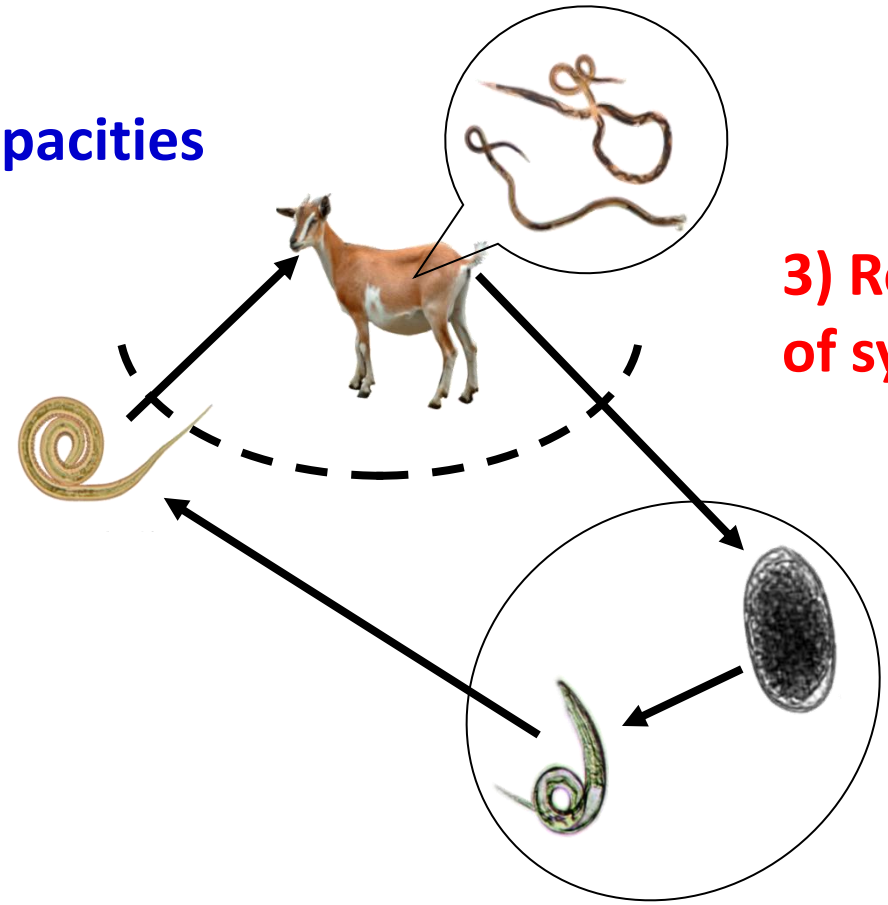
Major concern: Anthelmintic Resistance (AR)

Faecal Egg Count Reduction Test on 21 goat farms (late 2011)

Anthelmintic class	drug	farms in the survey	farms with AR
Benzimidazoles	netobimin	13	13
Imidothiazoles	levamisole	7	6
Macrocyclic lactones	ivermectine	17	15
Macrocyclic lactones	moxidectine	11	3

Principles of Integrated Control of GIN

1) Enhancing host defence capacities



3) Reducing the use of synthetic drugs

2) Decreasing the probability that GIN meet host

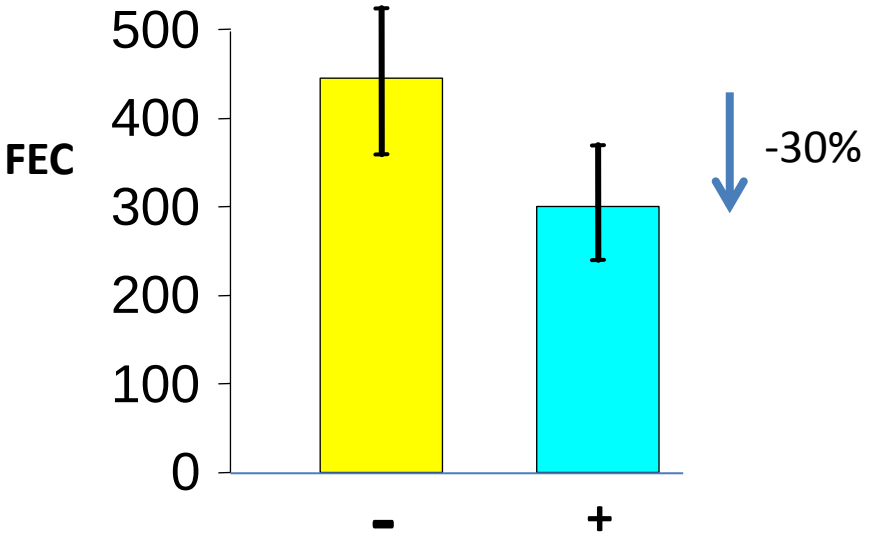
Principles of Integrated Control of GIN

1) Enhancing host defence capacities

Vaccine development: not available at the commercial level

Right parasite antigens not yet identified due to complicated life cycles

<u>Genetic</u>: breeding for resistance to GIN



Δ = 0.53 genetic sd (Ln(FEC+15))

Need goat breeder organization and scientific support

Principles of Integrated Control of GIN

1) **Enhancing host defence capacities**

Feed: immune process and mucosa repair need amino acids

Therefore amino acid shortage may impair defence against GIN.

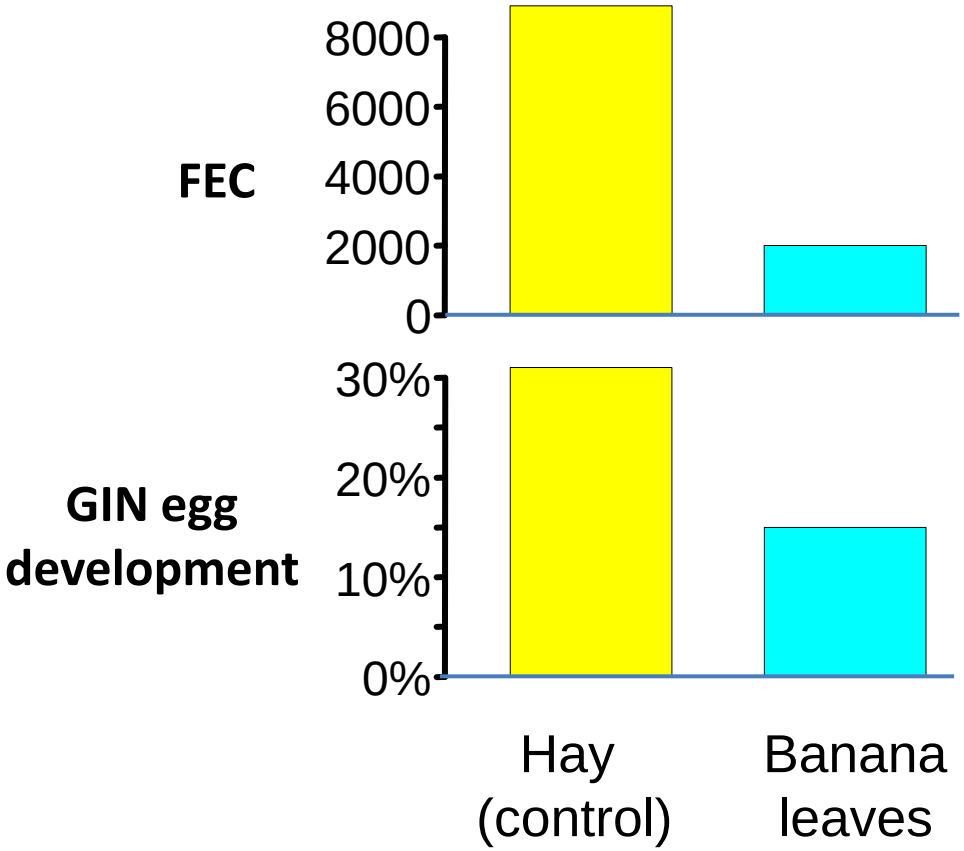
Providing protein supply increase the host resistance/resilience

*Direct or indirect effects of **secondary metabolites** from some **local protein sources** may impair GIN infection, egg production or larval development (Tannins, Saponins...)*

Principles of Integrated Control of GIN

1) Enhancing host defence capacities

Feeding with higher protein and secondary metabolite sources



Principles of Integrated Control of GIN

2) Decreasing the probability that GIN meet host through grazing management

Humid tropics:

Fast development of GIN free stages (1week from egg to infective larva)

Short survival of infective larvae in tropical conditions: <5%, 4 weeks after egg laying

L3 population peaks 2-3 weeks after egg laying (Aumont 1989, 1991)

➔ Design of **rotational grazing**

1 week in, 4 to 5 weeks out (compromise with grass quality)

Allows avoiding the worse, but not enough for the best

⚠ *Need pasture fencing or goat tethering*

Principles of Integrated Control of GIN

2) Decreasing the probability that GIN meet host through grazing management

Using GIN specificity

➔ **Mixed grazing** with Cattle (Horses, Geese...)

decrease in Goat stocking rate

associated species swallows and destroys Goat GIN infective larvae

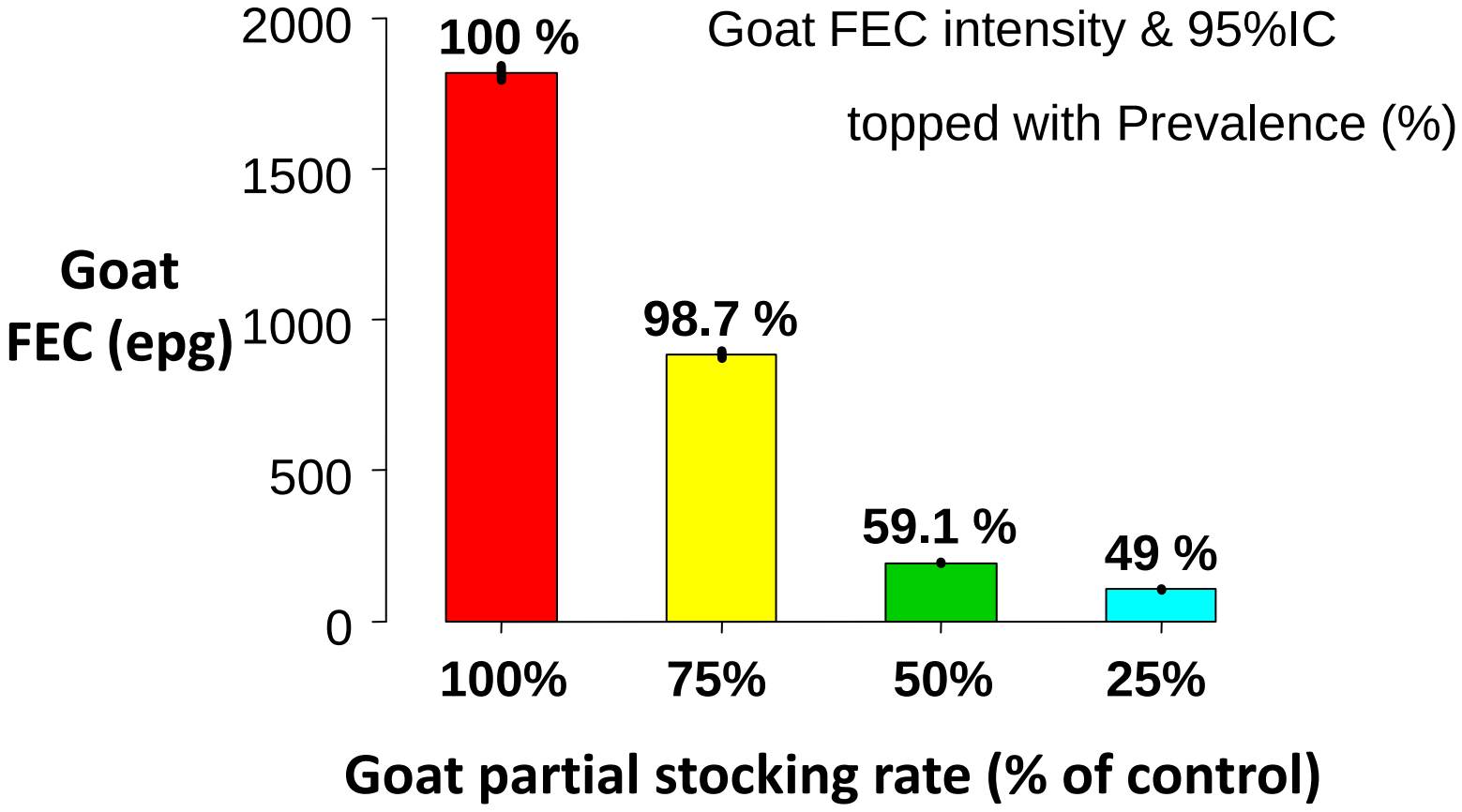
➔ Decrease in pasture contamination

⚠ *Need at least 2 different grazing species on the farm*

Principles of Integrated Control of GIN

2) Decreasing the probability that GIN meet host

Ex: Goat and Cattle Mixed Grazing



Principles of Integrated Control of GIN

3) Reducing the use of synthetic drugs

Keeping non-AR GIN in refugia for limiting AR development

Using Targeted Selective Treatments alone (on the whole flock)

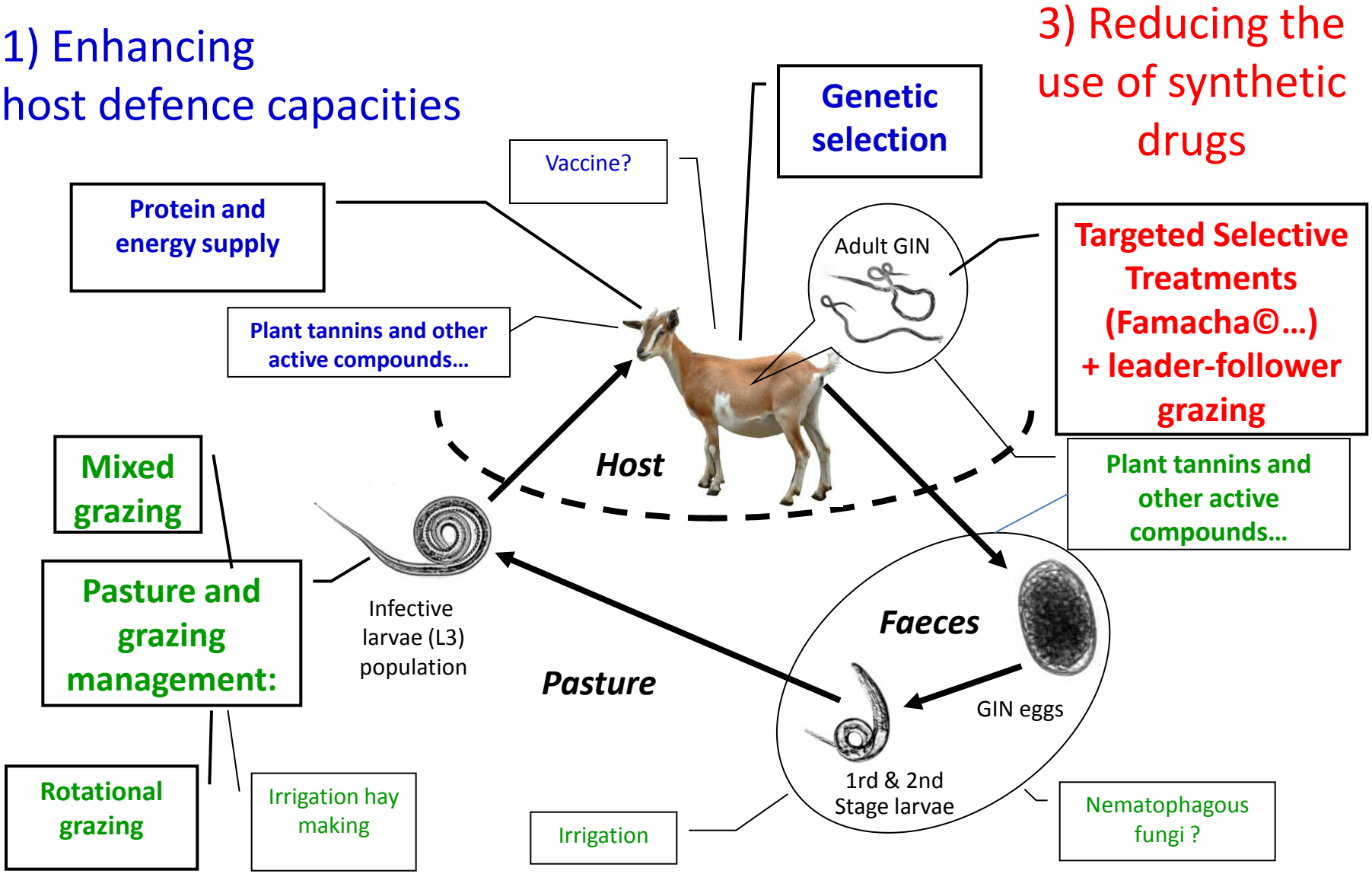
or in combination with strategic drenching and grazing management

Ex: **using FAMACHA© on adult goat flock (refugia)**

+ strategic treatments on kids

+ "leader follower" grazing design for weaned kids and adult goats (same GIN population for the whole farm)

Need suitable diagnostic tools and skilled farmers



2) Decreasing the probability that GIN meet host

Principles of Integrated Control of GIN

Conclusion and perspectives

Many ways for reducing the GIN impact are already available

To date, the challenge is to study interactions between the more promising ones

The next steps would be:

- ✓ ***building decision tools allowing farmers to manage sustainably GIN at the whole farm level***
- ✓ ***designing a general model of GIN-host relationship***

Thanks for your attention

ALIMENTATION
AGRICULTURE
ENVIRONNEMENT