Agricultural systems
by design

8th International Farming System Design Conference
Palaiseau – 25-29 August 2025

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ideas
INITIATIVE FOR DESIGN
IN AGRIFOOD SYSTEMS

Co-design enables farmers to conceive ways of managing grassland diversity for animal health despite a lack of technical references

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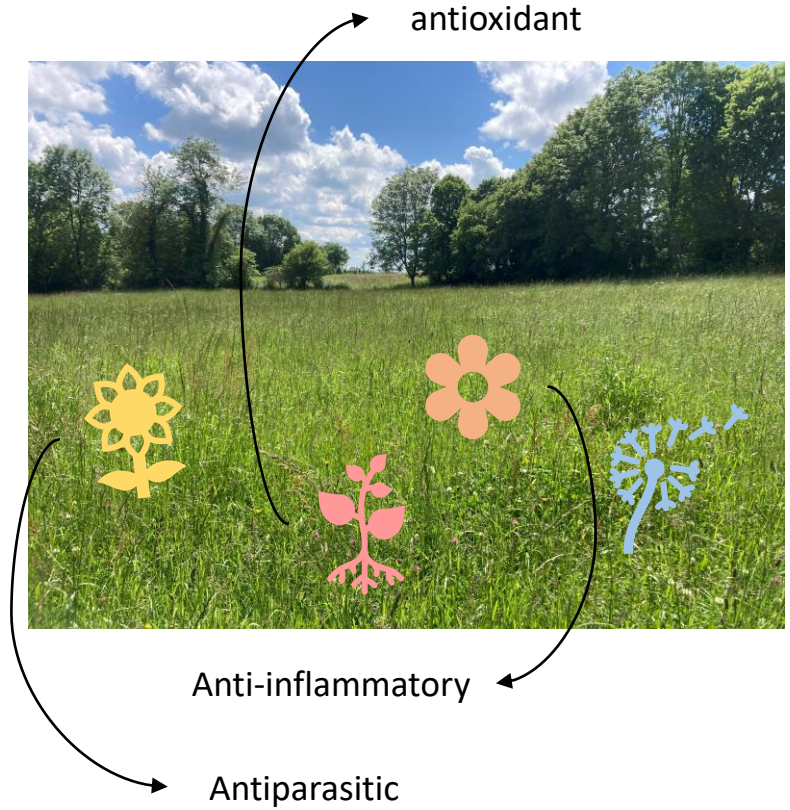
Context

- For animal production sustainability, need to develop Integrating Animal health Management practice *(Wezel et al. 2020)*
- Feeding is a factor of Integrating Animal health Management *(Lamothe et al., 2020)*
- In grasslands, some plants have medicinal properties but there is a lack of literature about *(Poutaraud et al., 2017) :*
  - *the mechanisms of action of the molecules they contain,*
  - *their interaction effects*
  - *the doses at which a benefit for animal health can be expected*
- Praidiv : French Project (CASDAR) aiming to produce references on health potential of grassland diversity

PRAIDIV
La santé est dans le pré

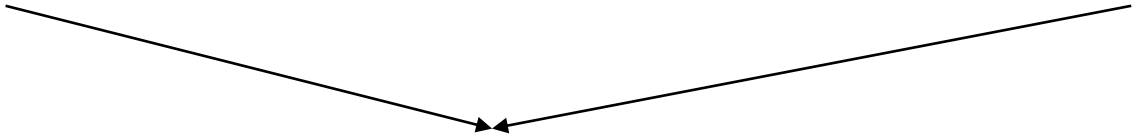


Context

- Previous work showed farmers make few links between grassland diversity and animal health and have few practices to benefit from it *(Rose et al., 2025)*
- Hypothesis : lack of scientific or technical knowledge has limited farmers from using grassland diversity for animal health

- Co-design enables to innovate in a context of lacking knowledge, by unfixing participants

(Prost et al., 2017)



Can co-design enable farmers to explore unknown ways of using grassland diversity for animal health?

What is the role of empirical knowledge *vs* scientific knowledge in the design process ?

Material and methods

CK Theory

C

Concept space

Unknown, undecidable but desirable proposition

K

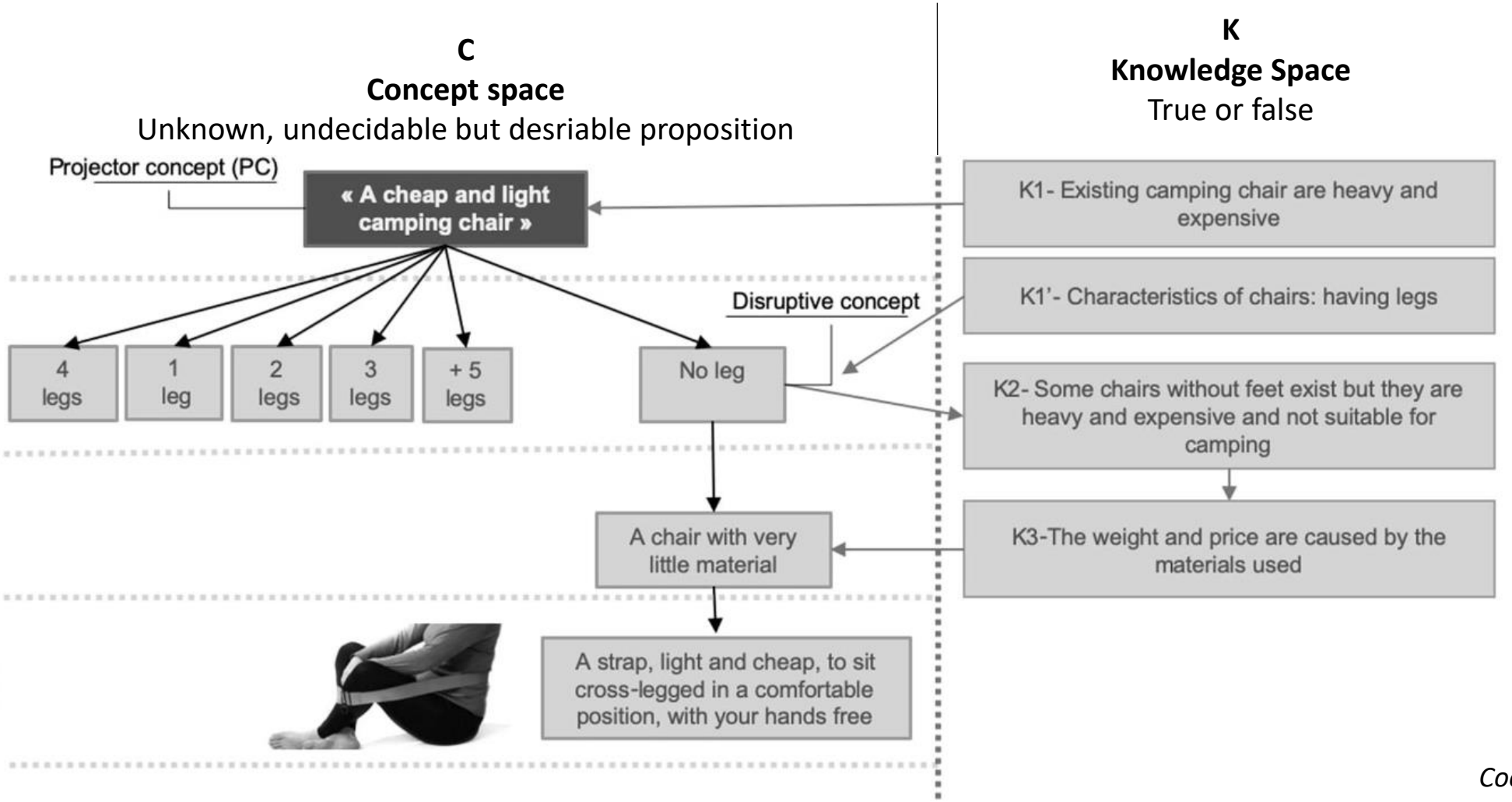
Knowledge Space

True or false

Hatchuel et al. (2011)

Material and methods

CK Theory



Coeugnet et al. (2023)

Material and methods

Workshop organization

Inspired from KCP workshop, in 3 steps :

K : Providing knowledge

C : Generating ideas

P : Developing a project

(Berthet, 2013)

Organized with a committee:

2 farmers
2 advisors
2 botanists
1 veterinarian
3 zootechnicians

<u>1st Workshop:</u> K

Presentations on Grassland & Health
Presentations on the properties of plants
Presentations on animal diversity to make the most of plant diversity
Farm visits
Farmers' testimonies in videos

4 farmers

<u>2nd Workshop:</u>

K

Presentation on practices and floral diversity
Presentation on diversity and product quality
Presentation on animal feeding behavior

C

Based on the example of a farm "Taking better account of grasslands diversity for cow fertility

P

Selection of ideas by the farmer

8 farmers and 3 advisors

Material and methods

Farmer case description

Individual Farm
2020
150 ha
50 suckler cows (Charolaise x Limousine)
47 suckler ewes

150 ha of **grassland**

90 ha former cultivated fields left to decay and re-colonised naturally

60 ha of natural grassland

Soil and climate

Indre, marsh of Brenne
Soil : poor, dry, acid

Herd management

Free range, no housing

Feed : rotational grazing and hay

Natural breeding, calving all year round

Fertility problem (long calving interval)

Material and methods

Analysis

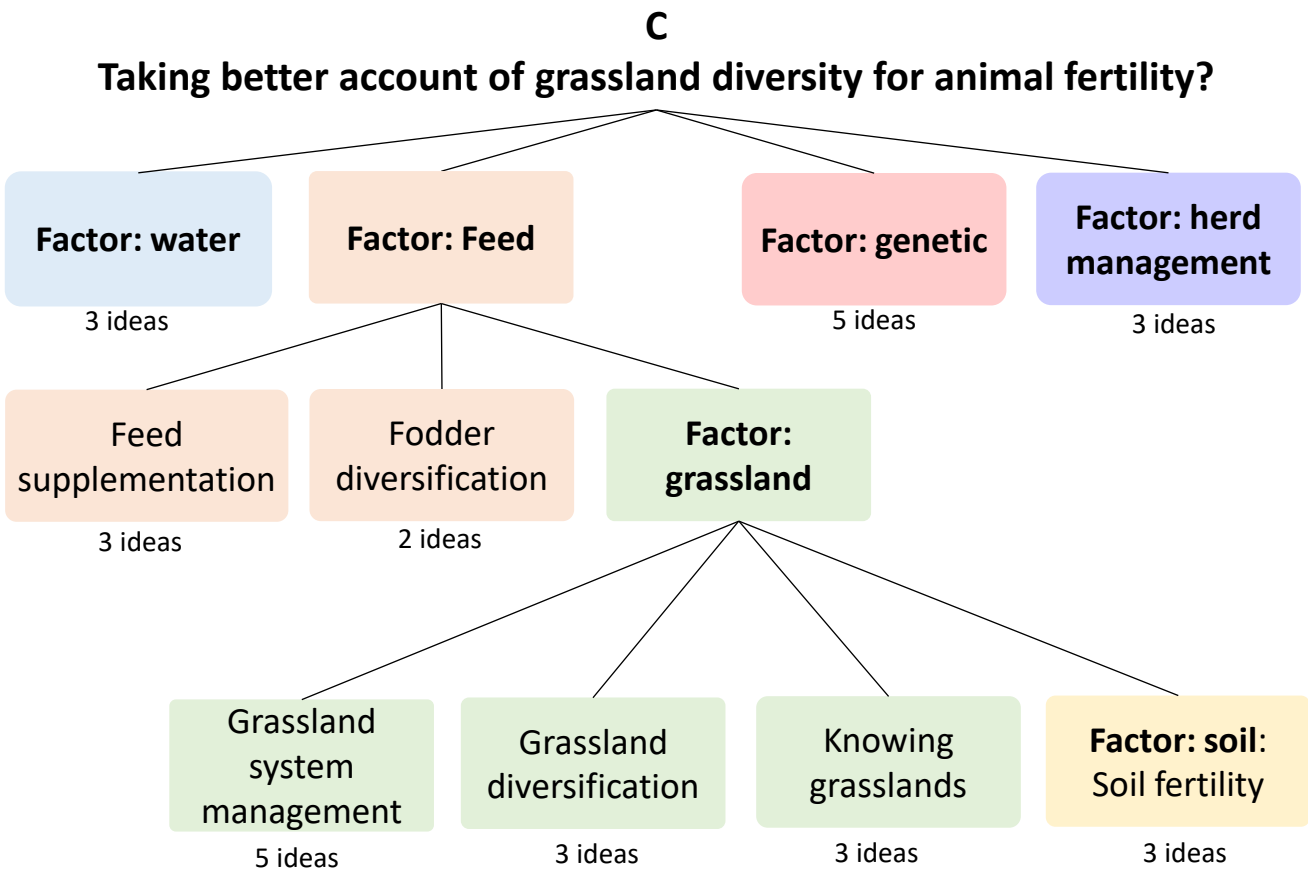
1. Workshop transcription
2. Formalizing the workshop in the CK Tree, noting every concept and area of knowledge
3. Gathering concepts under factors of Integrated Animal Health Management and Knowledge under themes

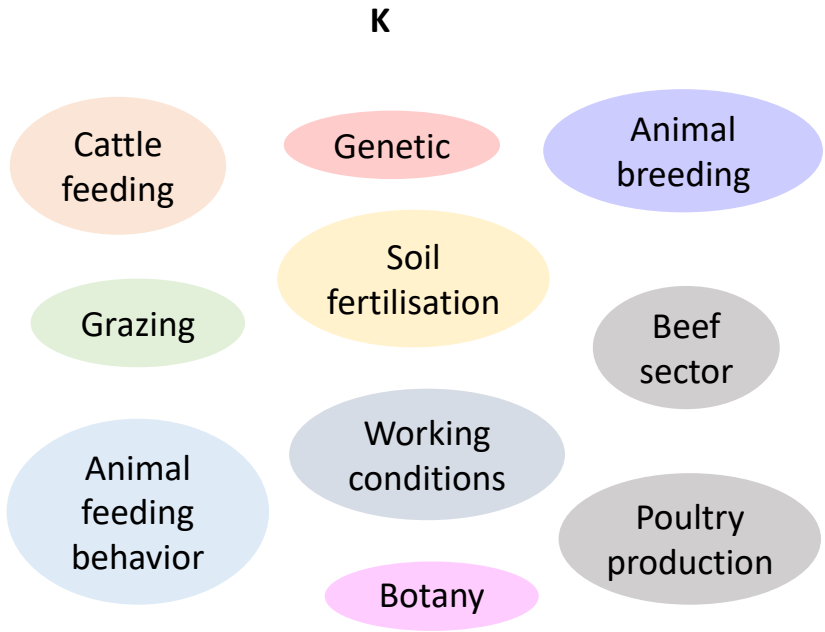
Analysis

A	B	C
Paths opened by participants	Type of Knowledge mobilised (scientific or empirical) Originality of concepts	Comparison of the contributions of participants from the former Praidiv tasks and the new participants.

Result

Summarized C-K Tree





Result

C-K Tree : focus on ideas related to grasslands

C

Taking better account of grassland diversity for animal fertility?

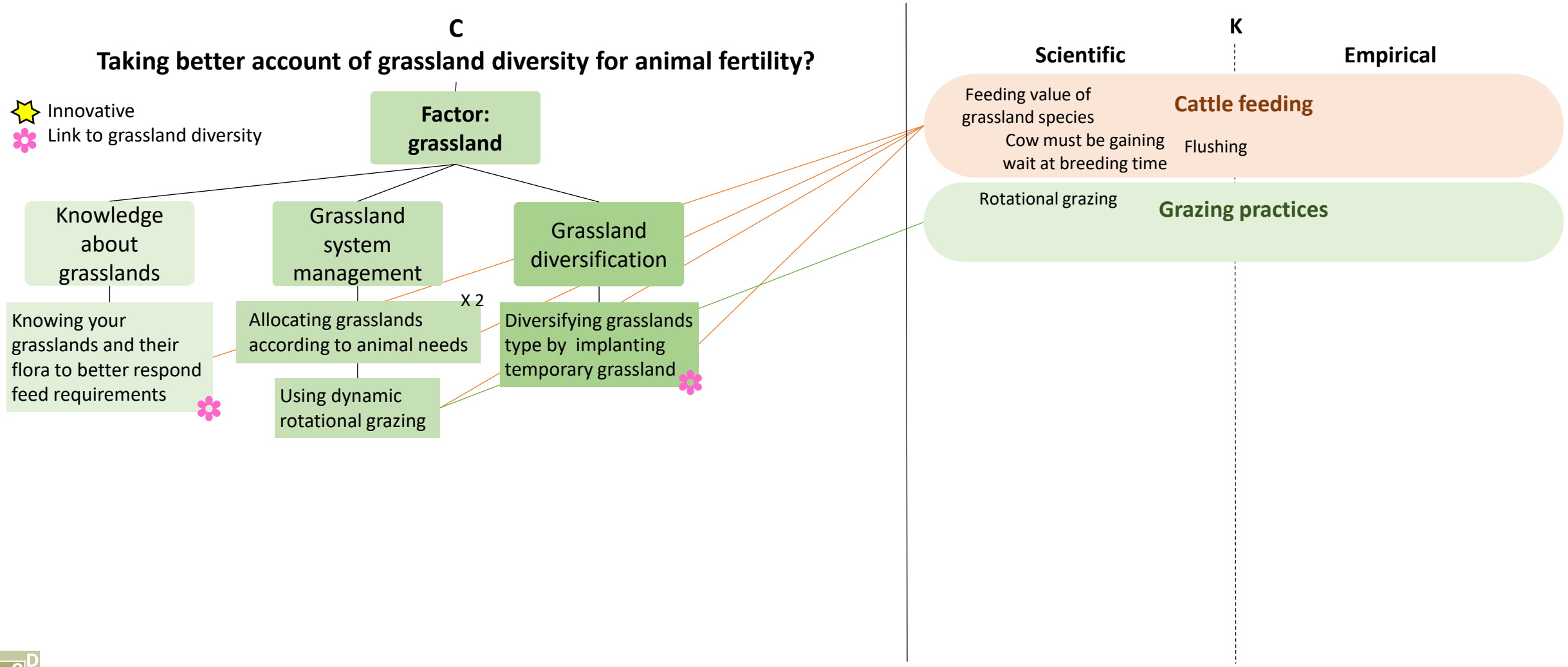
Innovative
Link to grassland diversity

K

Scientific | **Empirical**

Result

C-K Tree : focus on ideas related to grasslands



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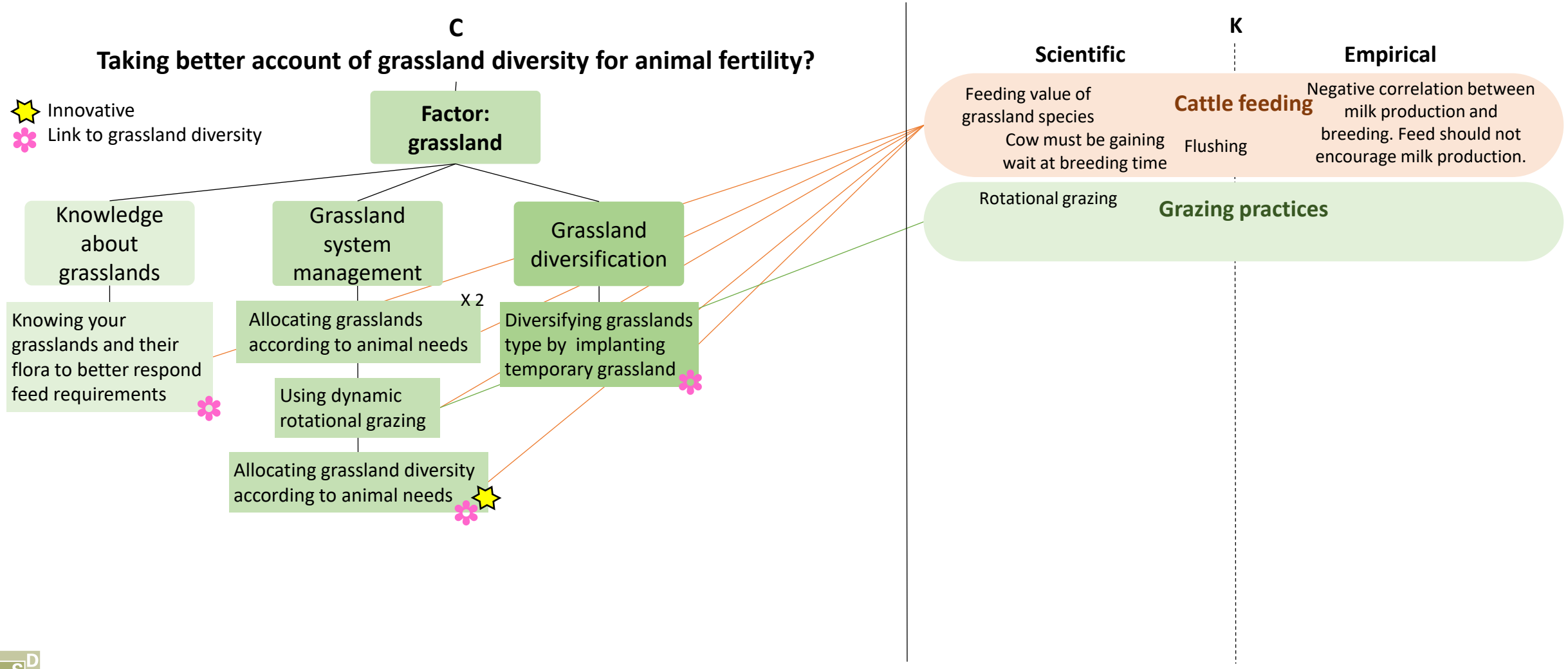
C-K Tree : focus on ideas related to grasslands



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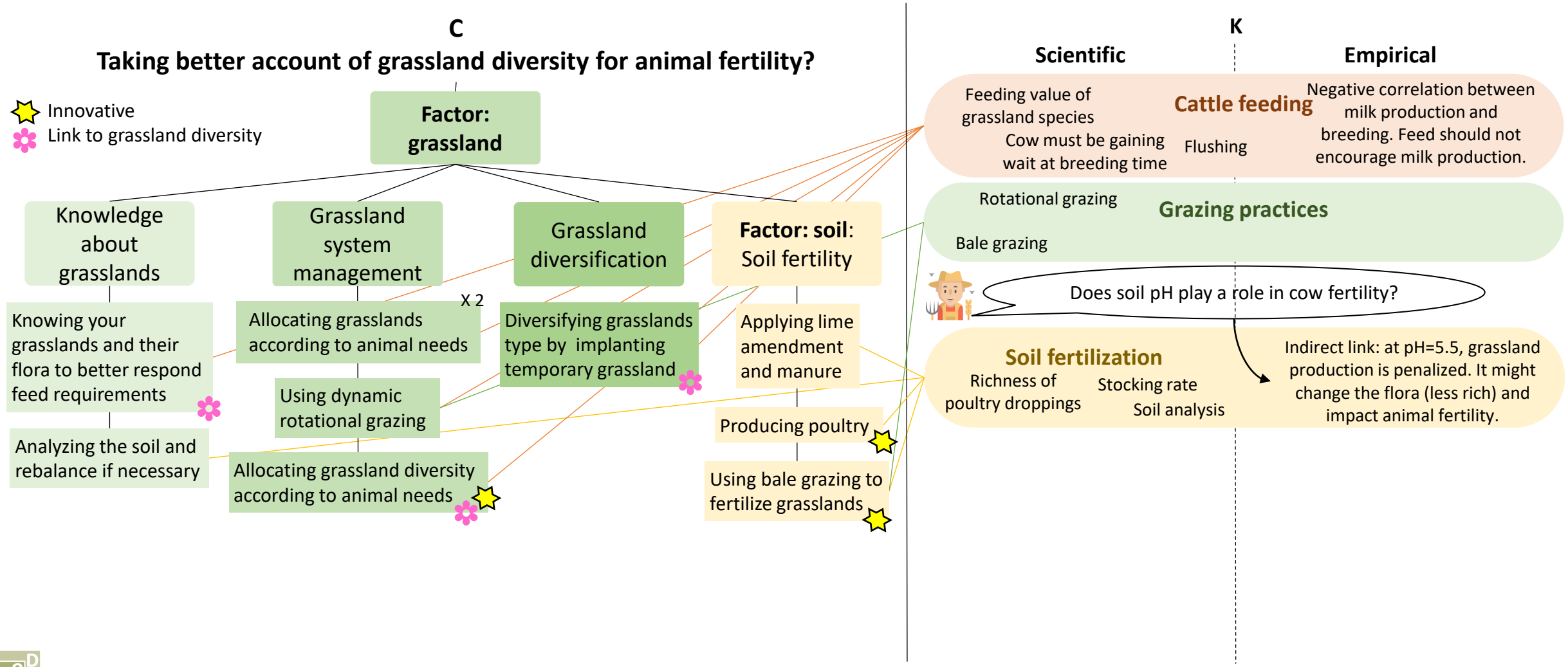

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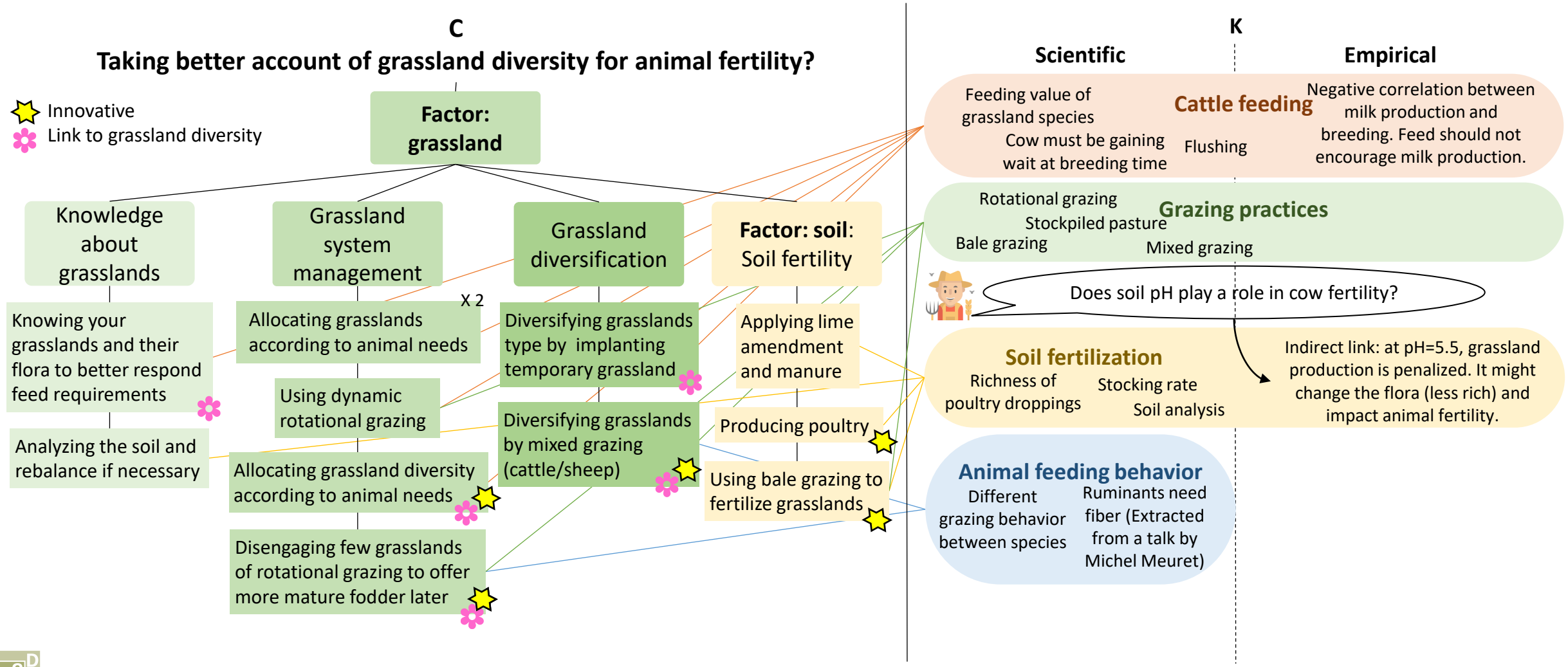

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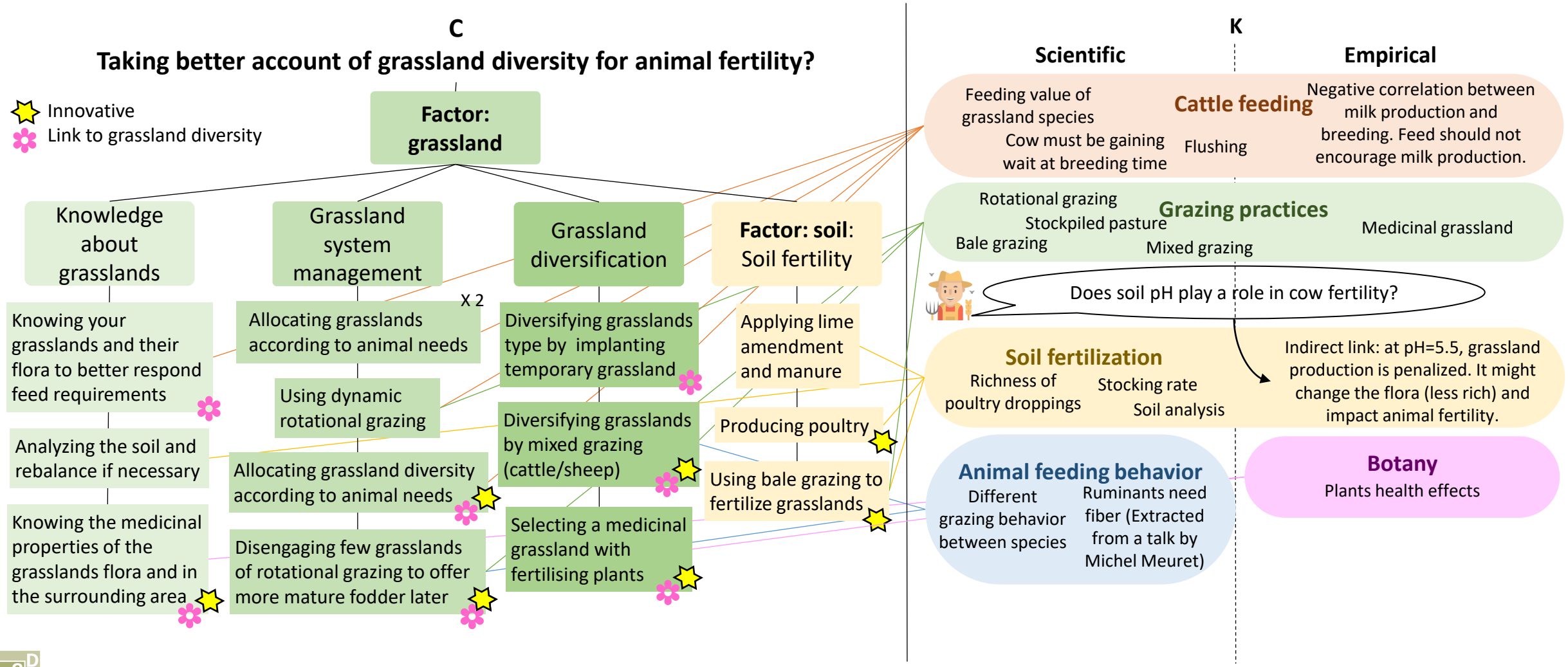

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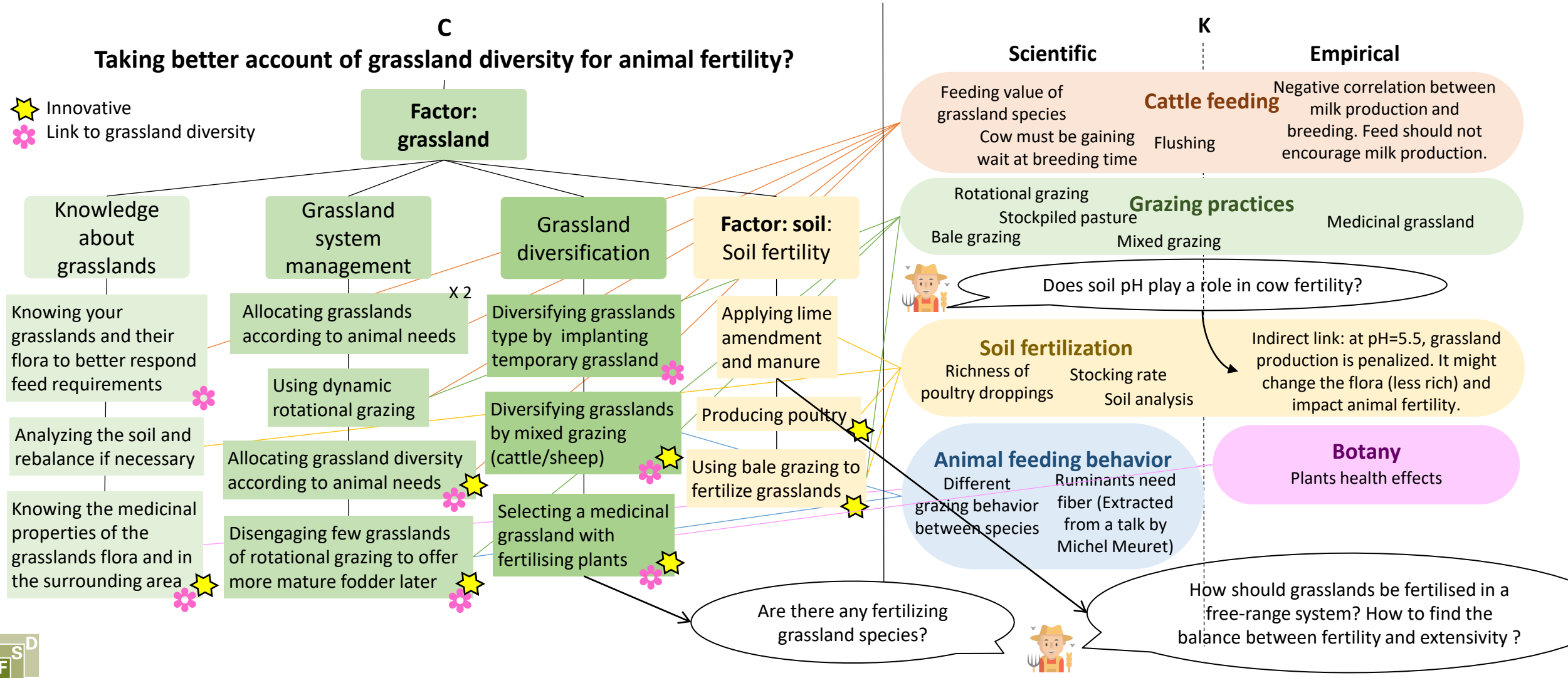

Discussion & Perspectives

- Farmers were unable to concentrate on the factor grassland, they needed to formulate ideas about other factors. It emphasize that **integrated animal health and fertility management is a strategy at farm scale,** that requires to find the balance between a large number of **interconnected factors**.

(Lamothe et al., 2020)

- Co-design enables farmers to overcome the lack of technical references and fixation effect (feeding supplementation) to formulate concepts linking grasslands diversity and animal health.
  - Use of scientific and empirical knowledge combined
  - The most innovative ideas are linked to non-scientific knowledge

(Agogue and Cassotti, 2013)

- Identification of lacking knowledge that may constitute future research project. Producing knowledge seems necessary to go further *(Ravier et al., 2018)*

Any questions ?


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Result

P : Ideas the farmer retains

- Knowing his grasslands to better meet feed requirements
- Flushing

Result

Comparison of contributions between former Praidiv participants and new participants