



LEGVALUE Project (started in 2017)
<http://www.legvalue.eu>

Introduction – Key-note

Concept and challenges of value chains for Protein crops

Marie-Benoît MAGRINI

Economist, INRA & Toulouse University, France
Head of legumes research group at INRA
ODYCEE Research team on knowledge and
innovation dynamics in value chains and territories

marie-benoit.magrini@inra.fr

Célia CHOLEZ

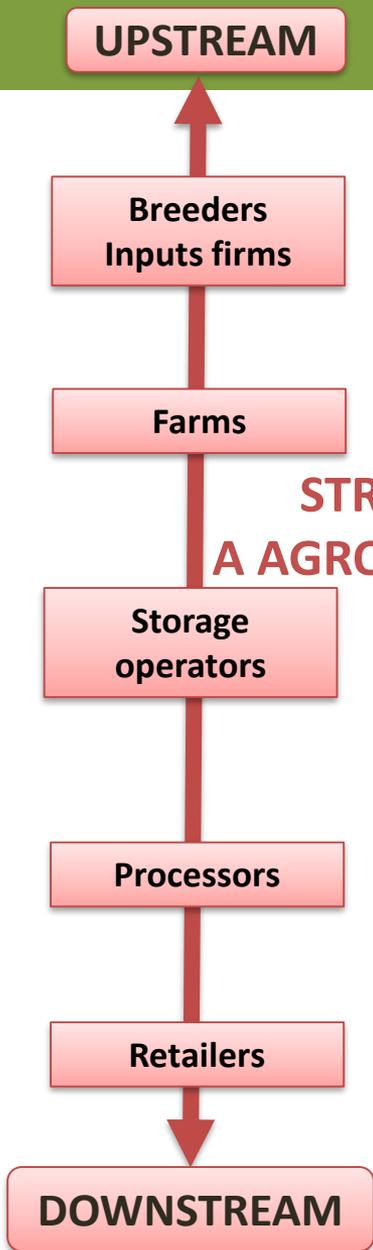
PhD student in economics, INRA &
ADEME, France
ODYCEE Research team

Celia.cholez@inra.fr

Workshop « Supply Chains in the EU Protein Sector »
Chalon-sur-Soâne, 11&12 July 2018

The basis...

key-concepts : SC / VC / “Filière”

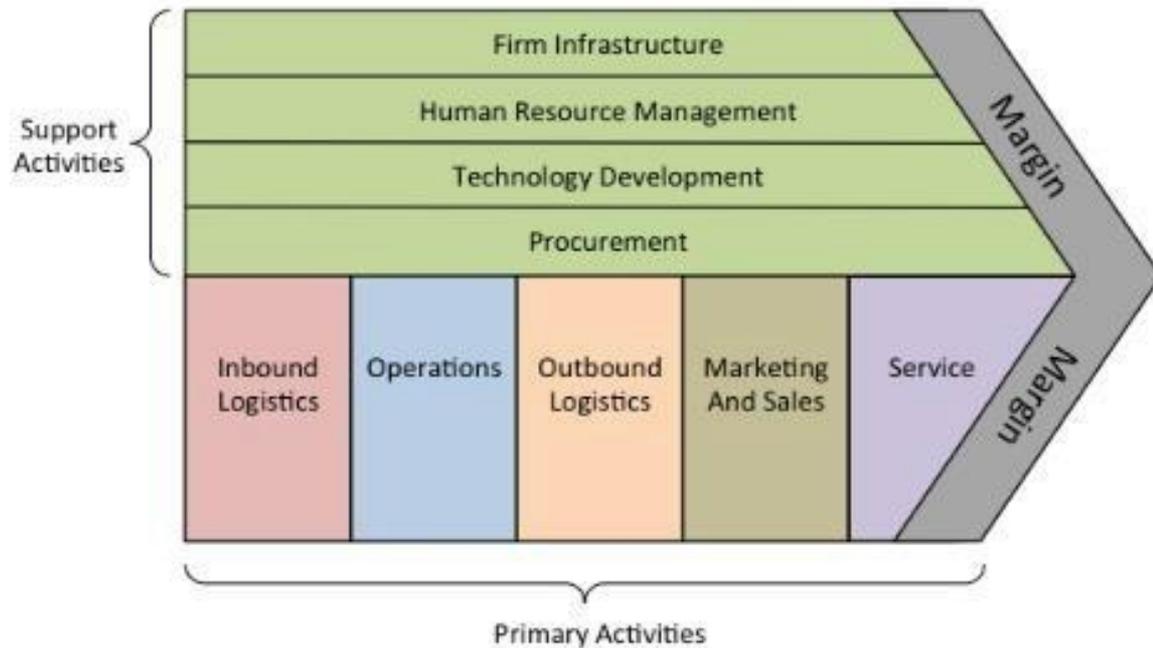


STREAMS OF A AGROFOOD SC

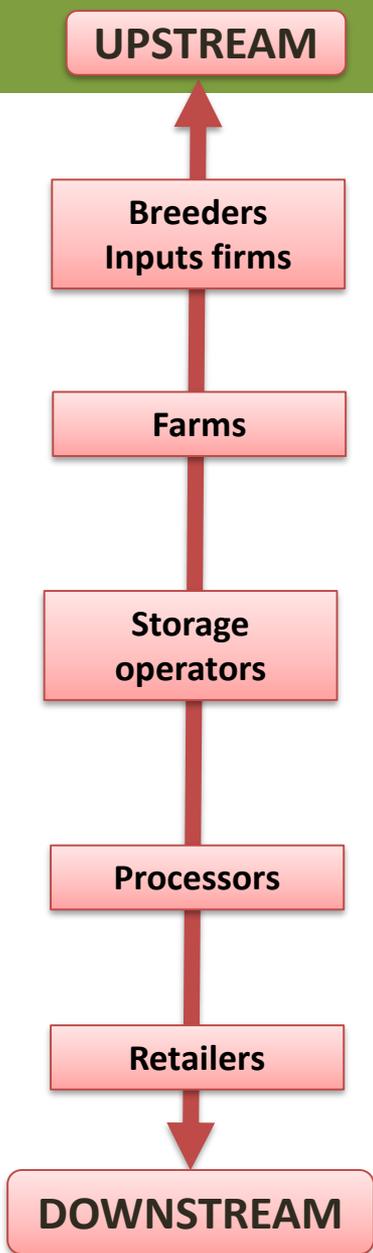
Supply Chain (SC) : the process of all parties involved in fulfilling a customer request

Filière

Value Chain (VC): the set of interrelated activities a company uses to create a competitive advantage (Porter definition)



key-concepts : SC / VC / “Filière”



Value Chain (VC): the set of interrelated activities a company uses to create a competitive advantage (First Porter definition)

A key trade-off for any firm: « MAKE OR BUY »
i.e. the way to govern transactions of goods & services

Value Chain (VC): the set of interrelated firms that create a competitive advantage for each of them and in the sector

A « demand-side » approach

Why understanding the way firms are organized is important ?

« **organization and governance, are essential for understanding how an economic system works** (...) finding the appropriate organization of **transactions** influences the capacity of taking advantage of the division of labor and specialization that feed growth. And it is through the **modalities of governance** associated to alternative organizations, for example, the type of contract linking partners, that **bargaining power is delineated** and that negotiations develop. Indeed, from an economic point of view a negotiation is primarily about the allocation of rights to use goods or services, which characterizes **the type of organization and determines the power of the different parties involved.**

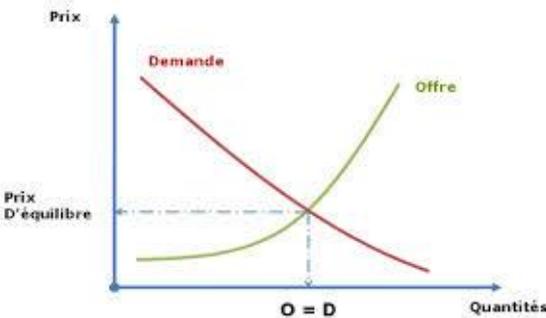
(...) [reveal] **conflicting groups of interest.**

(...) for measuring **the performance of the sector** and to assess **the role of different arrangements.**

(...) last, being aware of the diversity of organizations and their governance is a condition **for the development of adequate economic policies and sound regulation.** »

The governance structure of transactions: a basic 3-class typology

Spot Market



Hybrid form



Integration (Hierarchy)

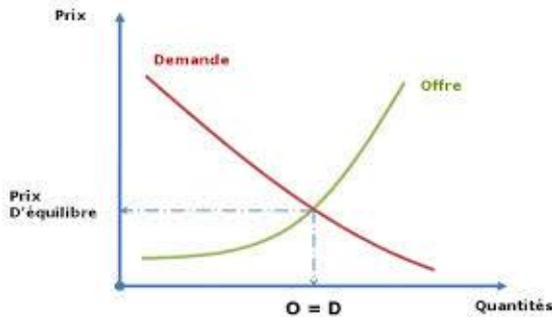


Production contract

An agreement between a buyer and a supplier that defines prices but also defines the conditions of the production process to fulfill buyer-specific demands.

A 3-class typology based on transaction costs

Spot Market



Hybrid form



Integration (Hierarchy)



Transaction costs :

« *the comparative costs of organizing rights to use resources and to transfer these rights* »

i.e.

The cost of contracting to outsiders and monitoring such contracts compared to the costs of organizing the activity in-house

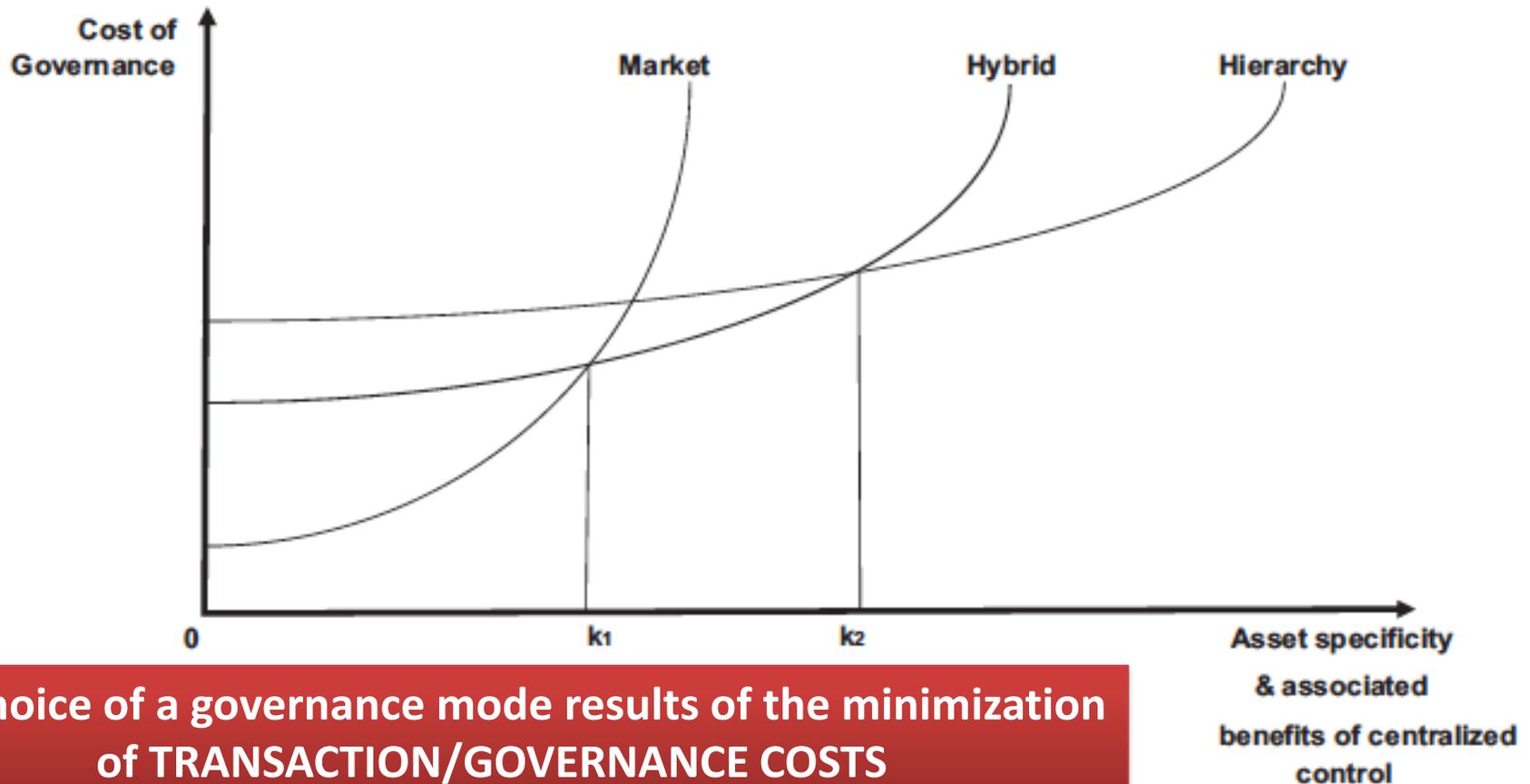
Whatever the mode of exchange, a transaction generates **COSTS** in addition to the price of the good/service exchanged:

Search costs, bargaining costs, Control costs, transport/logistic costs...

TRANSACTION COSTS
(also called Governance Costs)

> PRICES

A “huge” variety of organizational arrangements between market and hierarchy...



The choice of a governance mode results of the minimization of TRANSACTION/GOVERNANCE COSTS

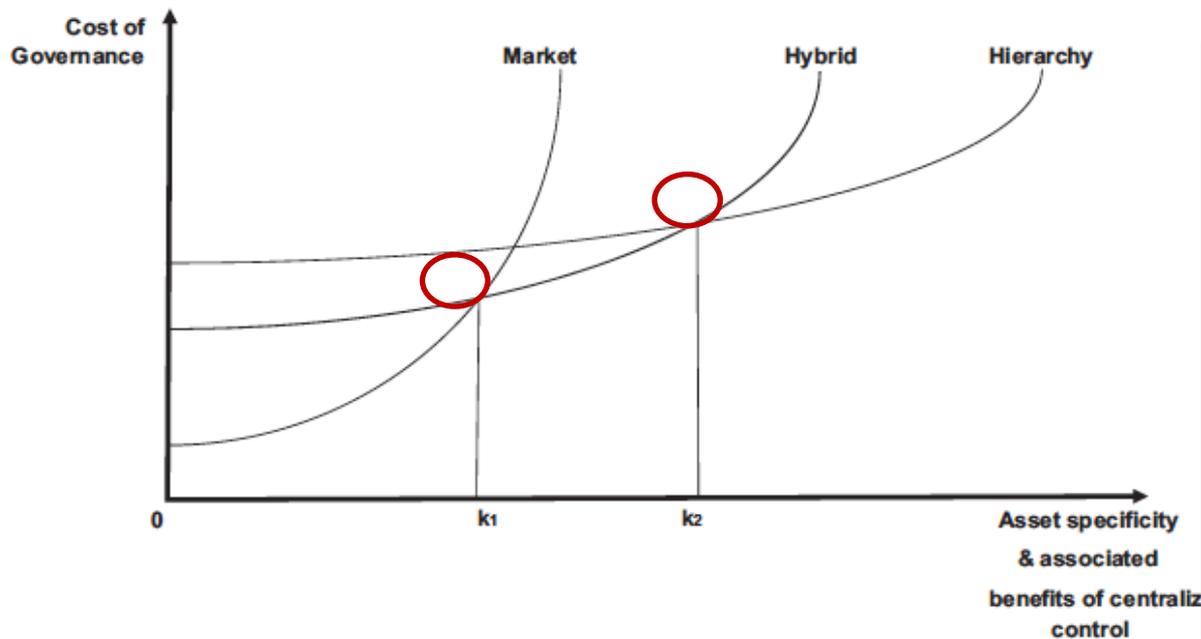
FIGURE 2 A TCE representation of the tradeoff among alternative organizations⁴

... depending on 3 main transaction attributes

“ALIGNMENT PRINCIPLE” : Costs aligned on the attributes of the transaction, and actors want to minimize those costs

1/ FREQUENCY : the more frequent a transaction, the lower the cost of organizing it

2/ UNCERTAINTY: the higher the uncertainty surrounding a transaction, the higher the transaction costs will be;



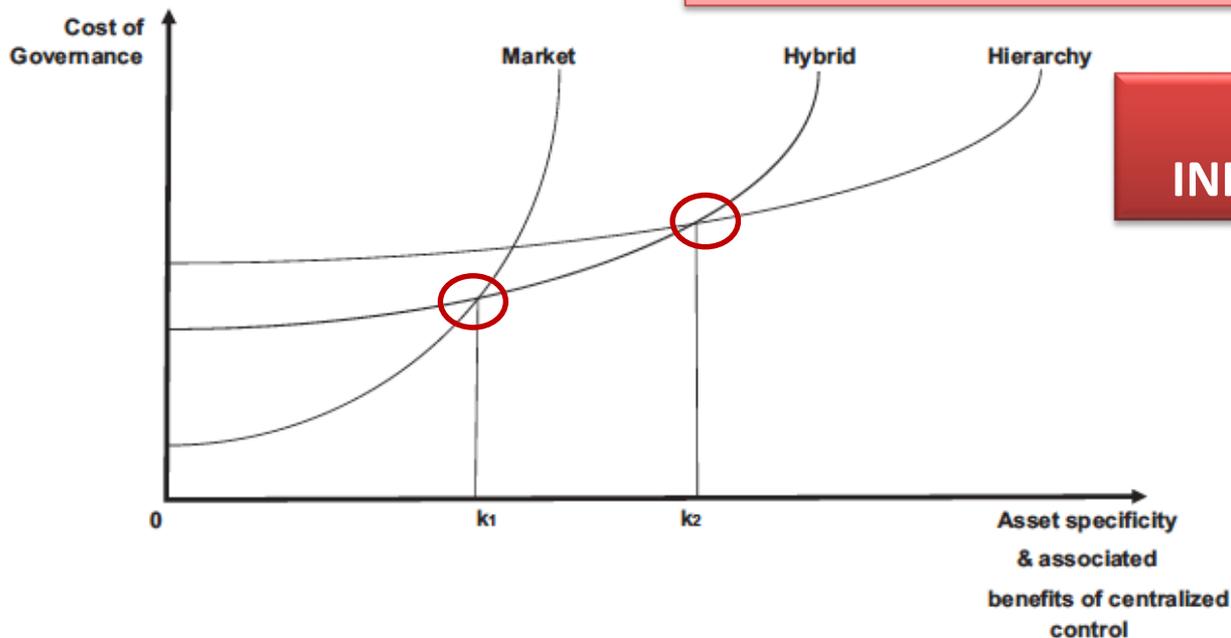
3/ SPECIFICITY OF ASSETS: the more specific and long-term the INVESTMENT required to make a transaction possible, the more contractual hazards the parties face, and the higher the transaction costs.

FIGURE 2 A TCE representation of the tradeoff among alternative organizations⁴

Organizational arrangement choice minimizes the transaction costs, depending mainly on:

UNCERTAINTY / SPECIFICITY OF ASSETS IN THE VC

« Natural factors and technology may command different degrees of specific investments; they may also generate uncertainty »



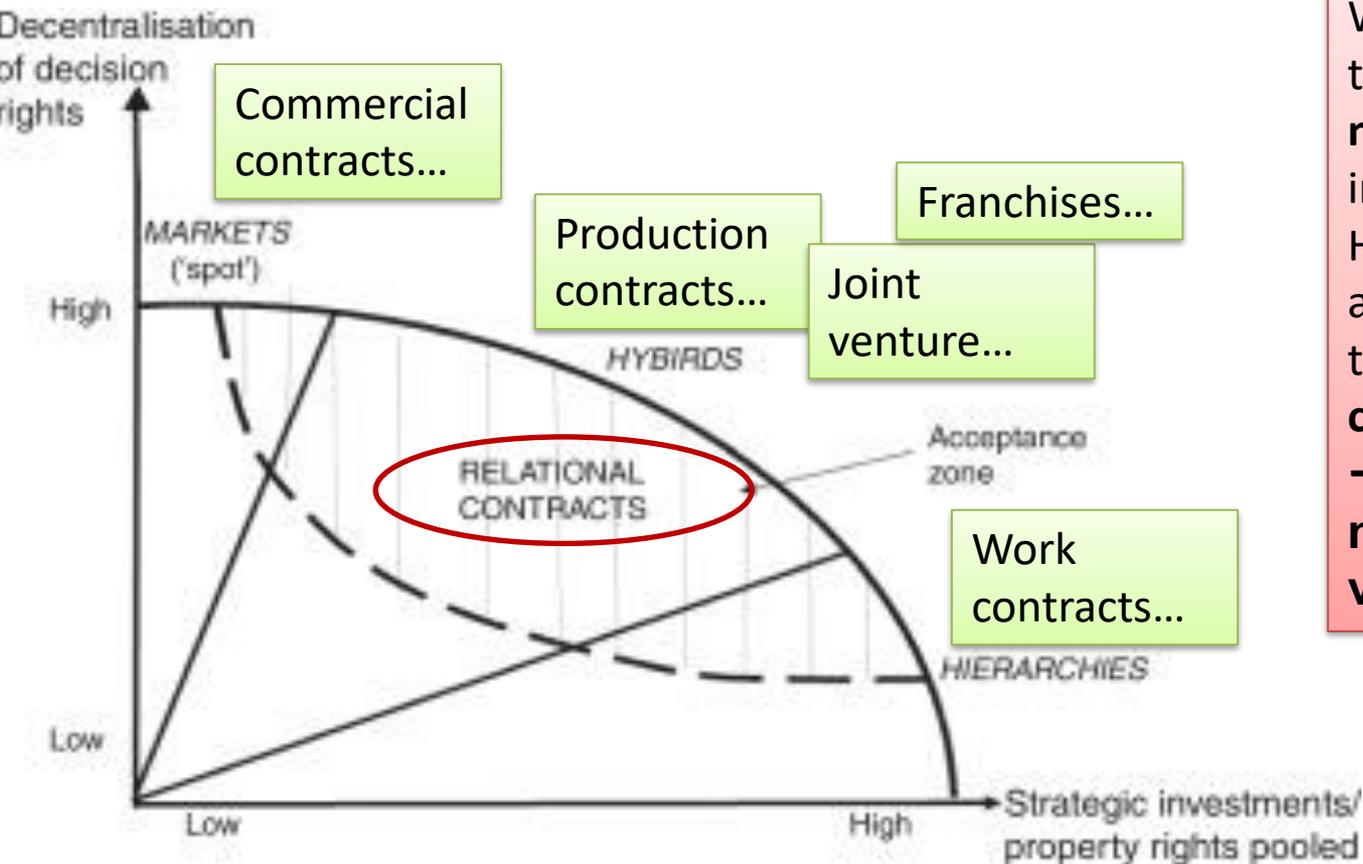
Another determinant : INFORMATION ASYMMETRIES

The concentration among processors and distributors, whereas producers remain relatively dispersed, has contributed to increase tensions in bargaining...

FIGURE 2 A TCE representation of the tradeoff among alternative organizations⁴

Complementarities between formal and relational contracts in organizational arrangements

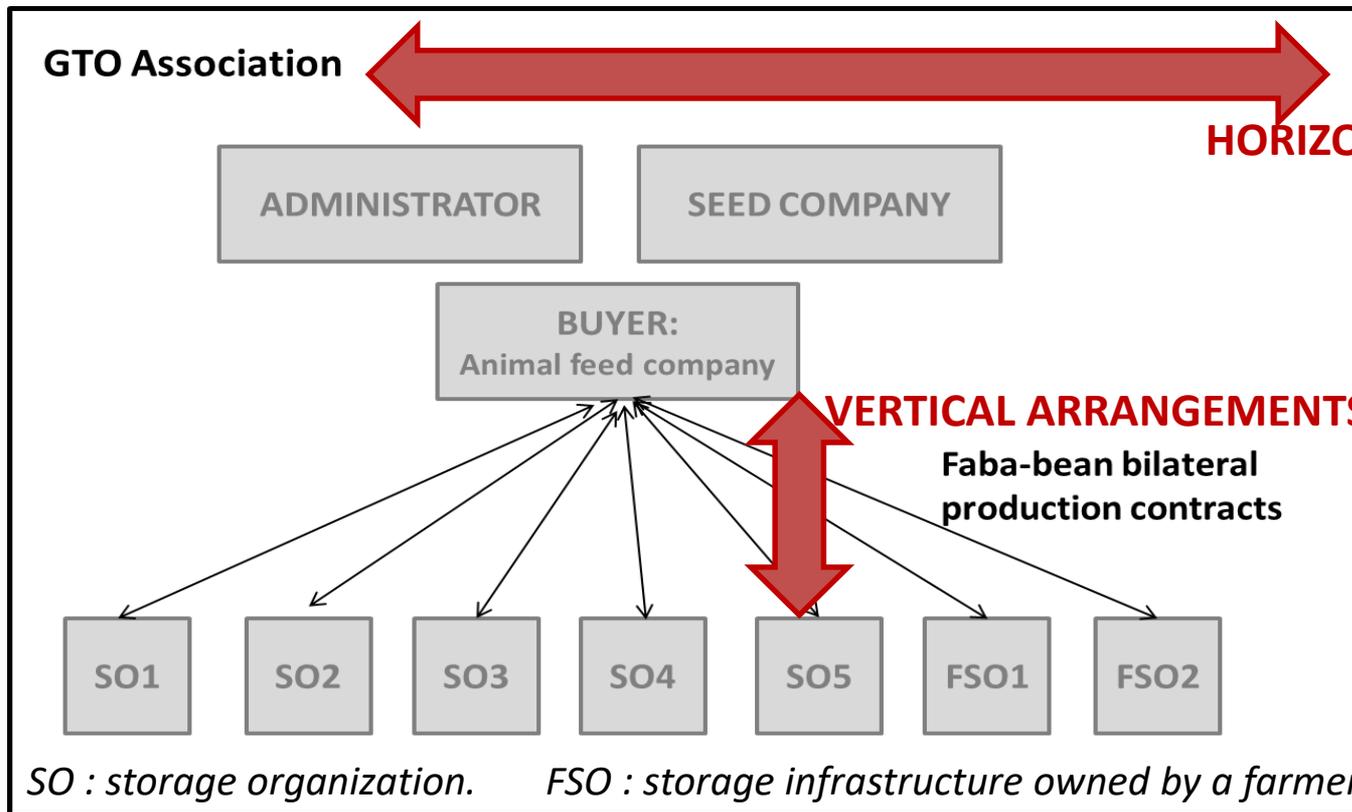
FORMAL CONTRACTS vs RELATIONAL CONTRACTS



Whatever the contract, there are **noncontractabilities** (ie. incomplete contracts) ... Hence, tacit and informal arrangements are required: they are called « **relational contracts** »

→ « **surrounding environment** » of contracts is **very important !**

Coordination in the agroindustrial sector increasingly relies on contracts, but contracts ALONE are not sufficient to develop a SC



HORIZONTAL ARRANGEMENTS:
association gathering
Several stakeholders

VERTICAL ARRANGEMENTS : contracts

**EXAMPLE of SC
launched by Valorex,
a feed company in
France**



**THE GOVERNANCE STRUCTURE OF TRANSACTIONS IS ALL THE MORE
IMPORTANT THAN CONTRACTS THEMSELVES**

The structure governance of transactions make competitors working together...

“There’s a good atmosphere in the association, even though in reality we are competitors. I mean, people work smart, you know. For now everything’s going well. “(SO5)

“I think we’re all learning. We learn to live together as competitors, I mean, working together. Because in fact, we are competitors but we work together! There’s some friction every day ... that happens, but at some point we [see] that we also have things in common which enables us to work together in one region...Competing companies can also work together! “(SO4)

“It's not common to have several operators like that on a project. Well, it's also because it's a small project, you know. I think it'd be more complicated if we managed wheat ... Then again, it's always the same, if we do it, it's really in specific niches. We couldn't do this with more standard products... ”(SO5)

**EXAMPLE of SC launched by Valorex, a feed company in France
SO storage organisation verbatims**

MEMBERS POOL RESOURCES (annual membership, development strategy, working time, knowledge...) TO STRUCTURE THIS CHAIN WHILE REMAINING COMPETITORS

... to develop collective knowledge, engaging competitors in a continuous progress

By limiting the risks of hold-up among stakeholders, production contracts foster specific investments, and also immaterial investments such as crop knowledge creation.

→ Learning on-line & learning off-line

- (i) if knowledge is created in research units (parallel to the production process in itself) it is referred to as learning *off-line* : *ex Data-base of storage organization*
- (ii) if knowledge is created through production practices, it is learning *on-line* ; *ex : know how of farmers*

Besides of the contract in itself, **it is the governance structure in its whole, which relies on face-to-face interactions, that can foster knowledge exchange.** So, contracts by supporting learning-by-interaction through their governance structure (both vertical and horizontal) enable a form of organizational learning.

→ **Very relevant when knowledge must be local-adapted, must be created...**

Price setting : how create incentives on minor protein crops?

The rationale behind the minimum guaranteed price is: ensuring the farmer a margin equivalent to major crop (like maize or wheat) + extra price for change incentive

We can also imagine a more formal indexation

$$= \sum_{i=1}^n \left(\frac{P_i}{P_{i-1}} \right) \left(\frac{Q_i}{Q_{i-1}} \right) + \sum_{j=i}^m \left(\frac{P_j}{P_{j-1}} \right) \left(\frac{Q_j}{Q_{j-1}} \right)$$

Price setting : how create incentives on minor protein crops?

The rationale behind the minimum guaranteed price ...

We can also imagine a more formal indexation

This price setting appears as a solution to allow new development of crops...

→ to create price incentives during the time required to develop IRA

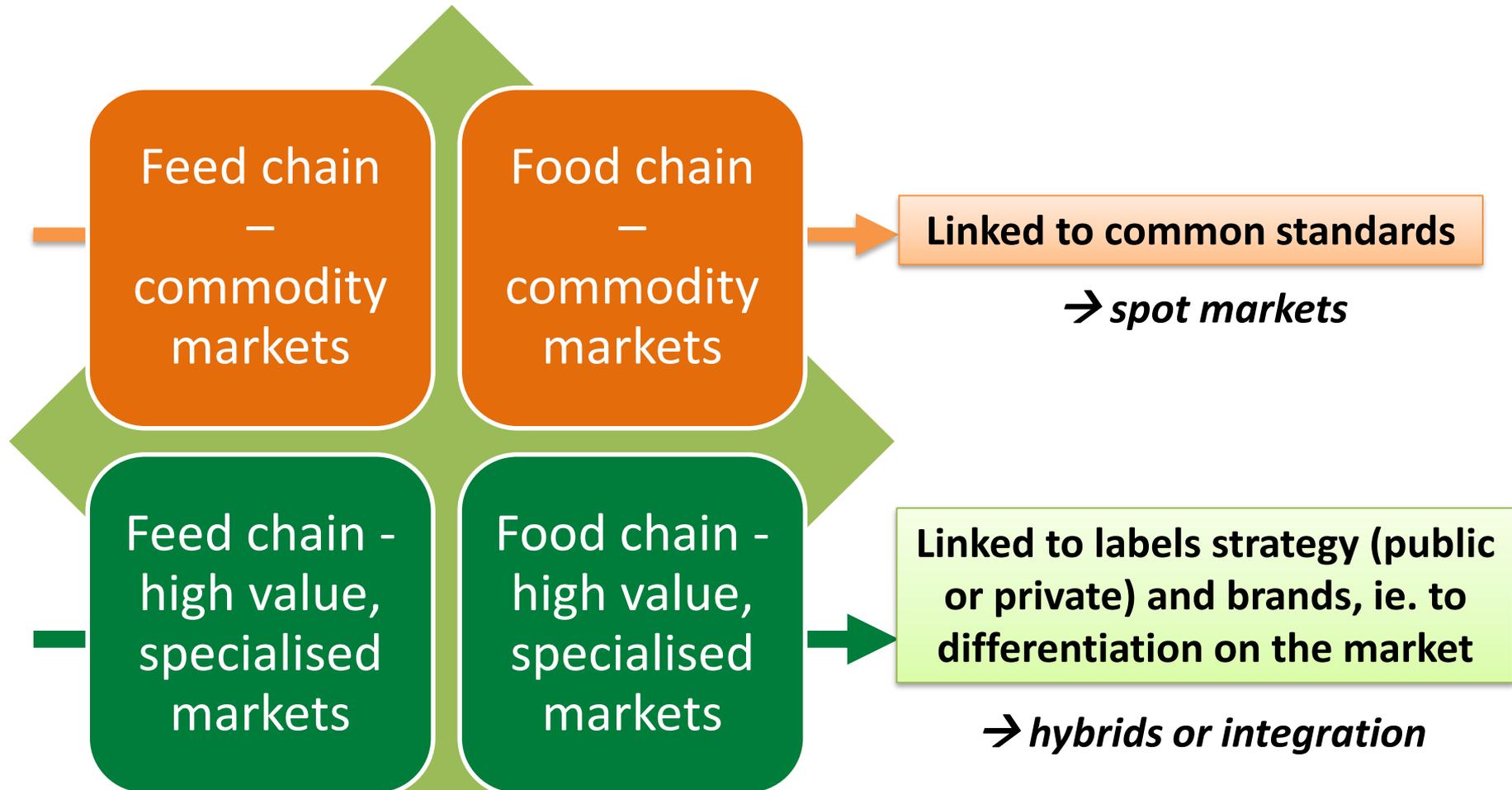
**(Increasing returns to adoption) to « catch up» (partially) the competitive gap
with major crops....**

Perhaps we also have to improve or perfect our skills on monitoring this crop, but here again, it's always a question of scale, because currently we're very limited and we're not going to deploy the heavy artillery [put great effort] on something that's small for now. But if this ends up growing, then yes, I think there's a need [to invest to improve]. (SO1)

EXAMPLE of SC launched by Valorex, a feed company in France

Can we establish a typology of
organizational value chains
among protein crops ?

WS organized into 4 sessions



Any firm could be engaged itself in those various VC !!

Feed chain – commodity markets

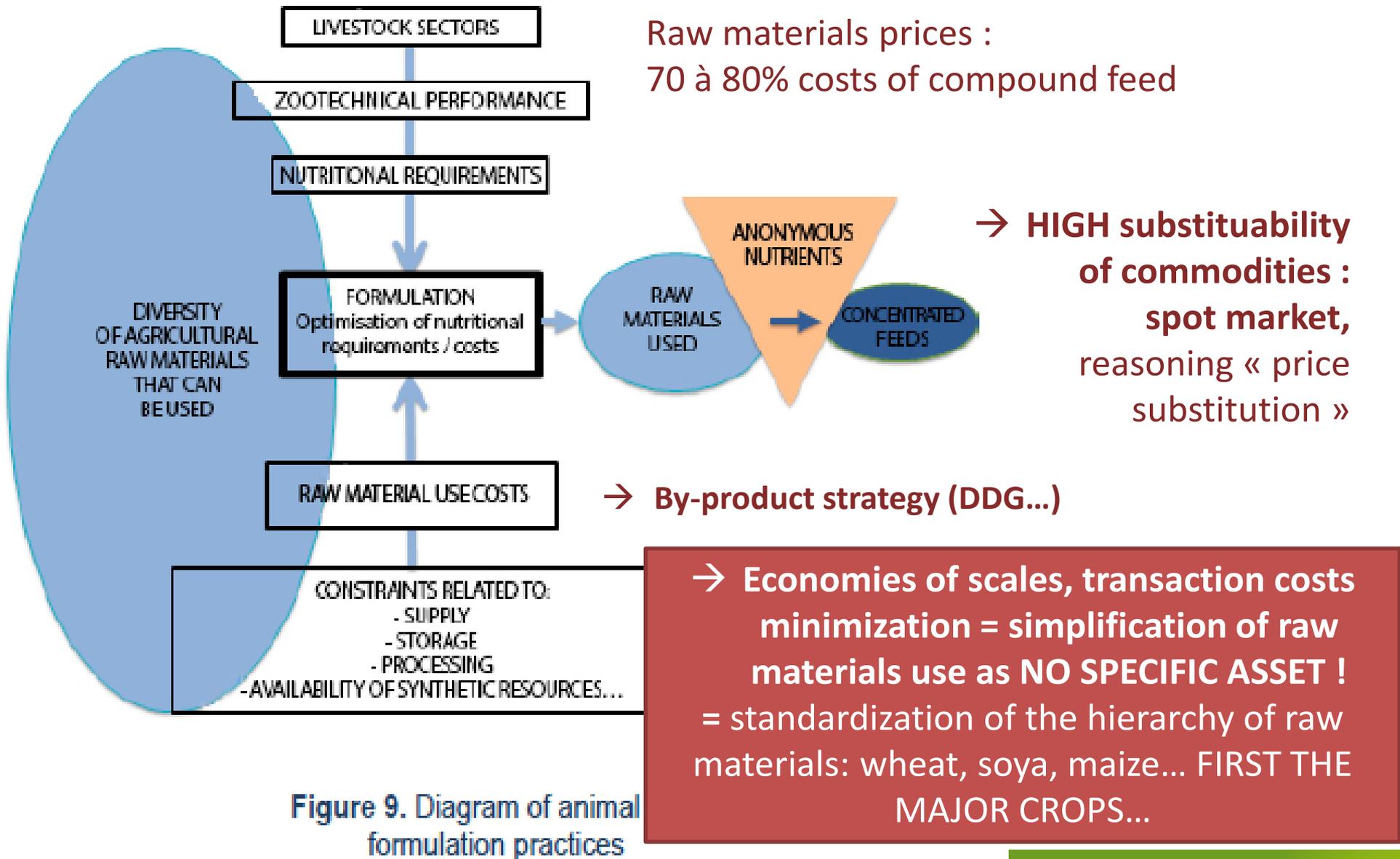
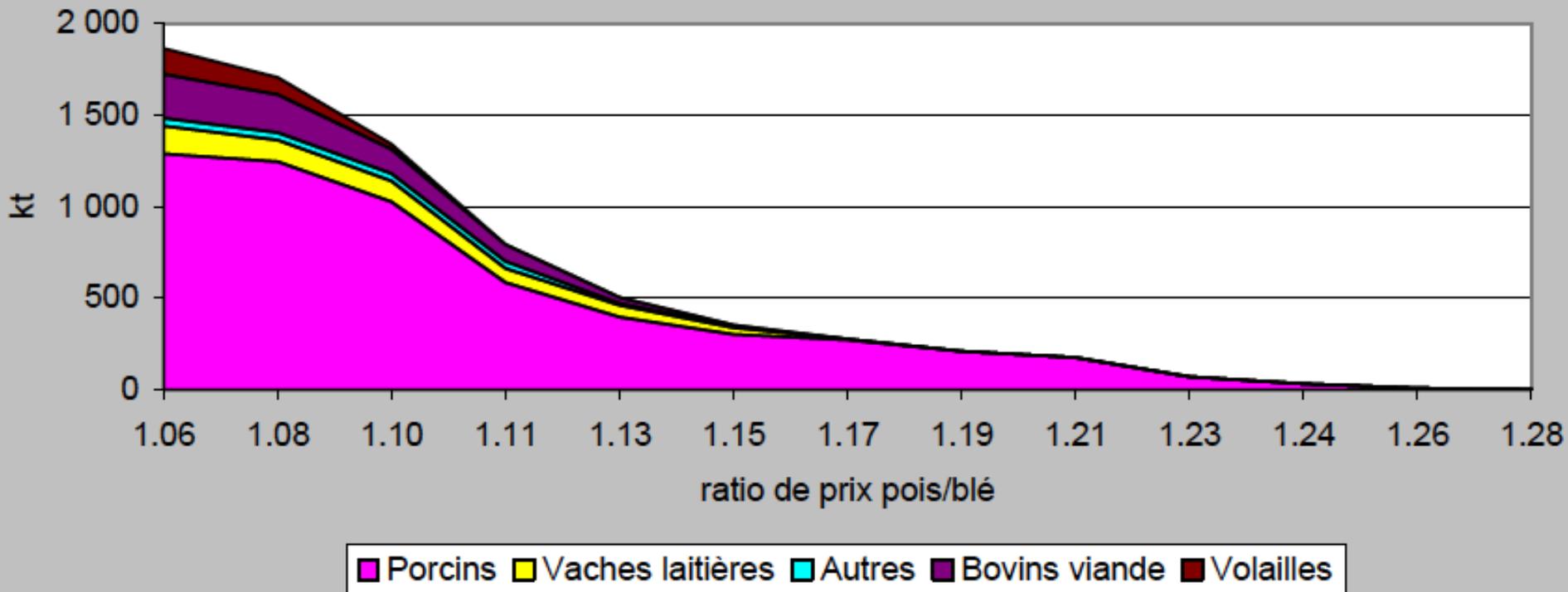


Figure 9. Diagram of animal formulation practices

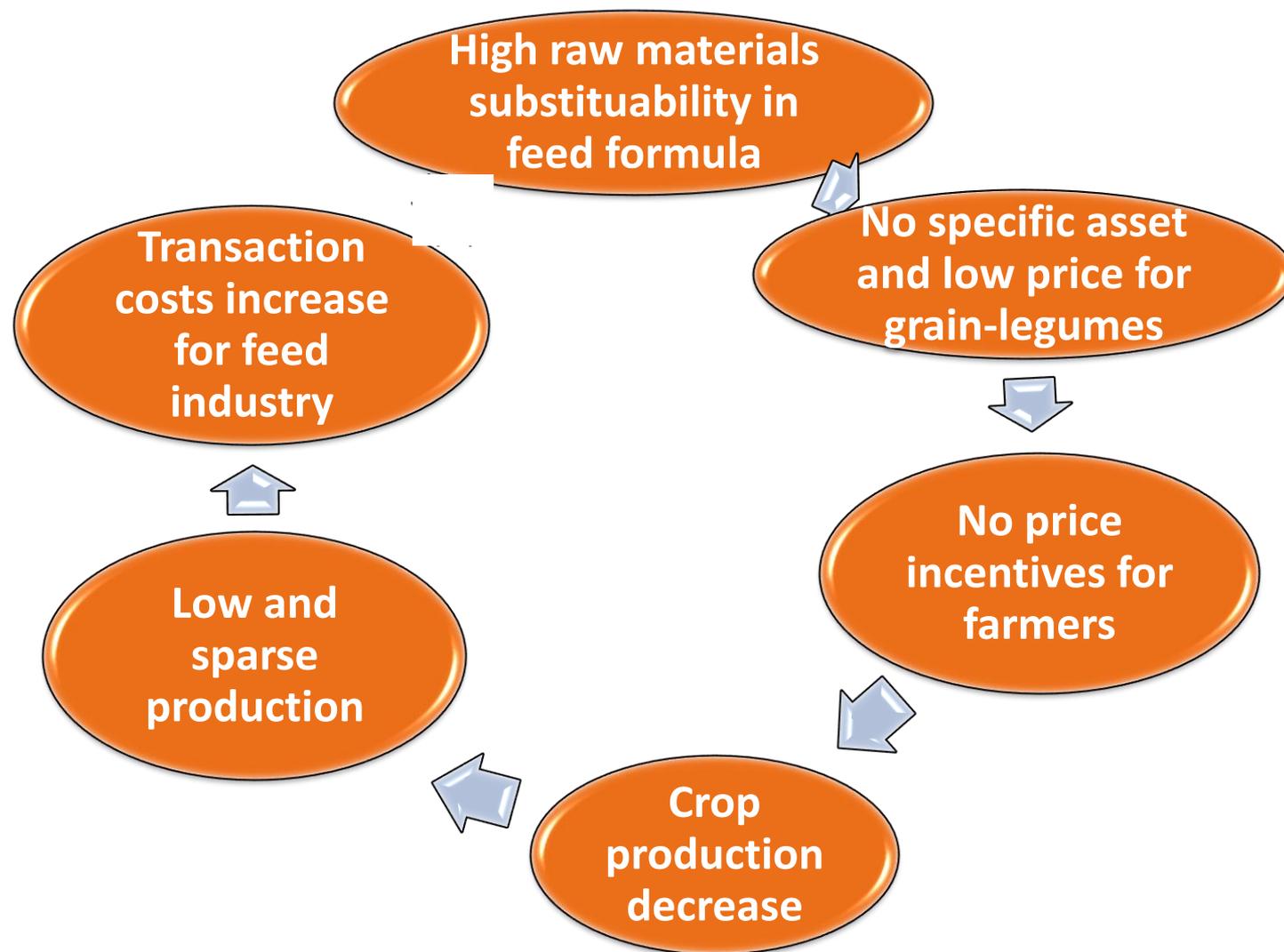
Feed chain – commodity markets

→ HIGH SUBSTITUABILITY OF COMMODITIES = « PRICE SUBSTITUTION » RATIONAL

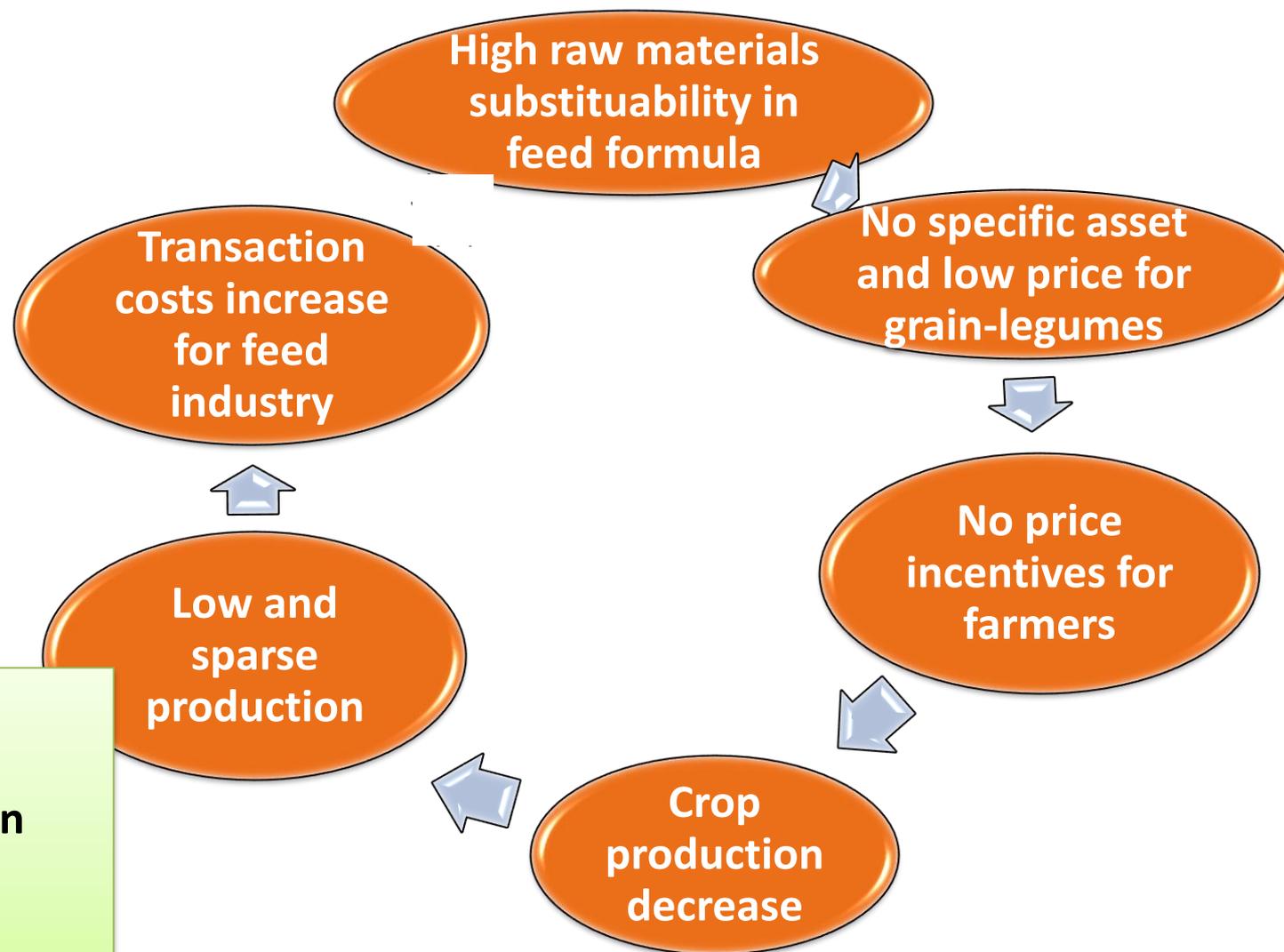
A CEREOPA simulation (in 2012) on the incorporation of PEA in feed manufacturing formulation according to the price ratio PEA/WHEAT



Failure of previous European « Protein Plans »

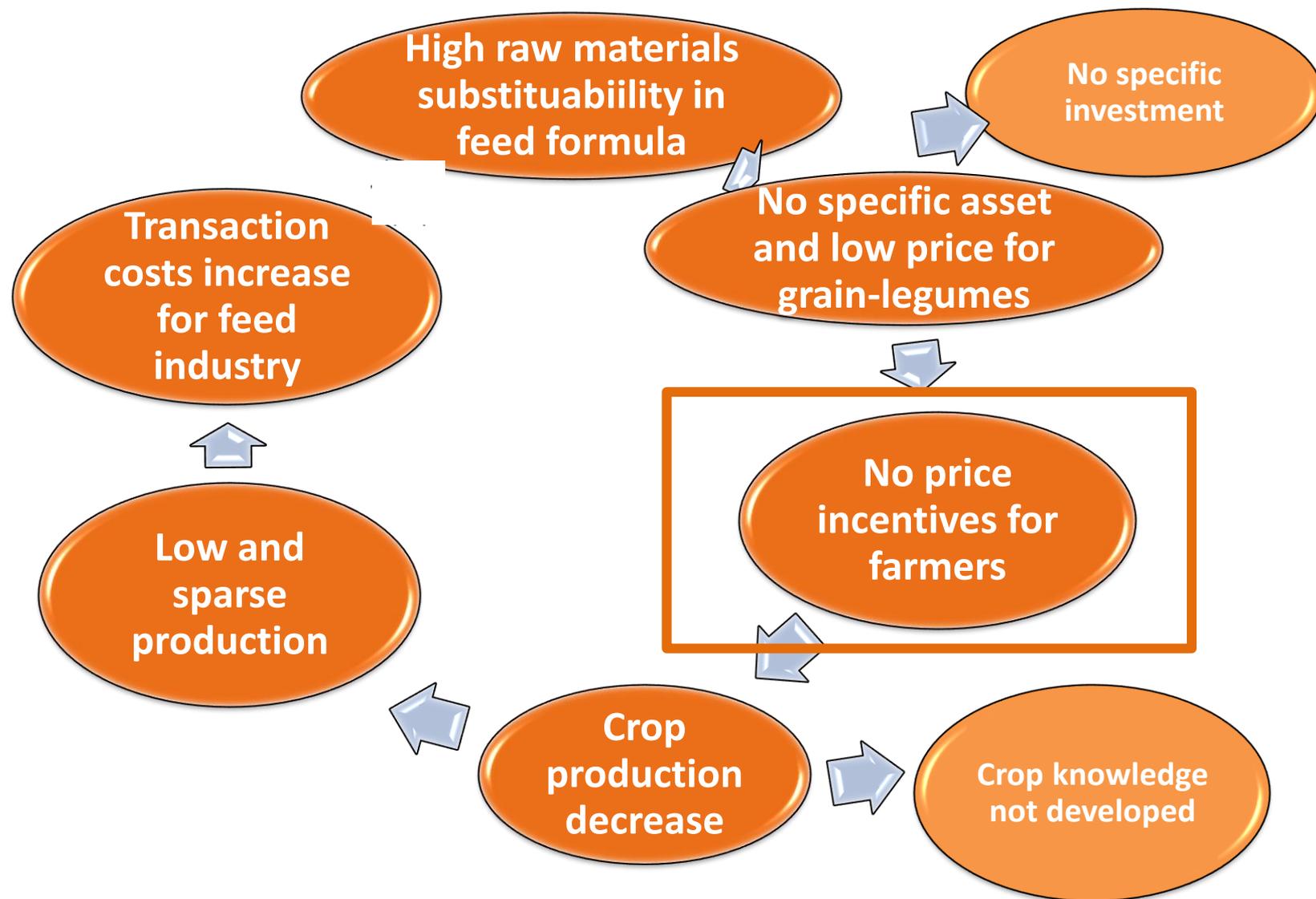


Failure of previous European « Protein Plans »

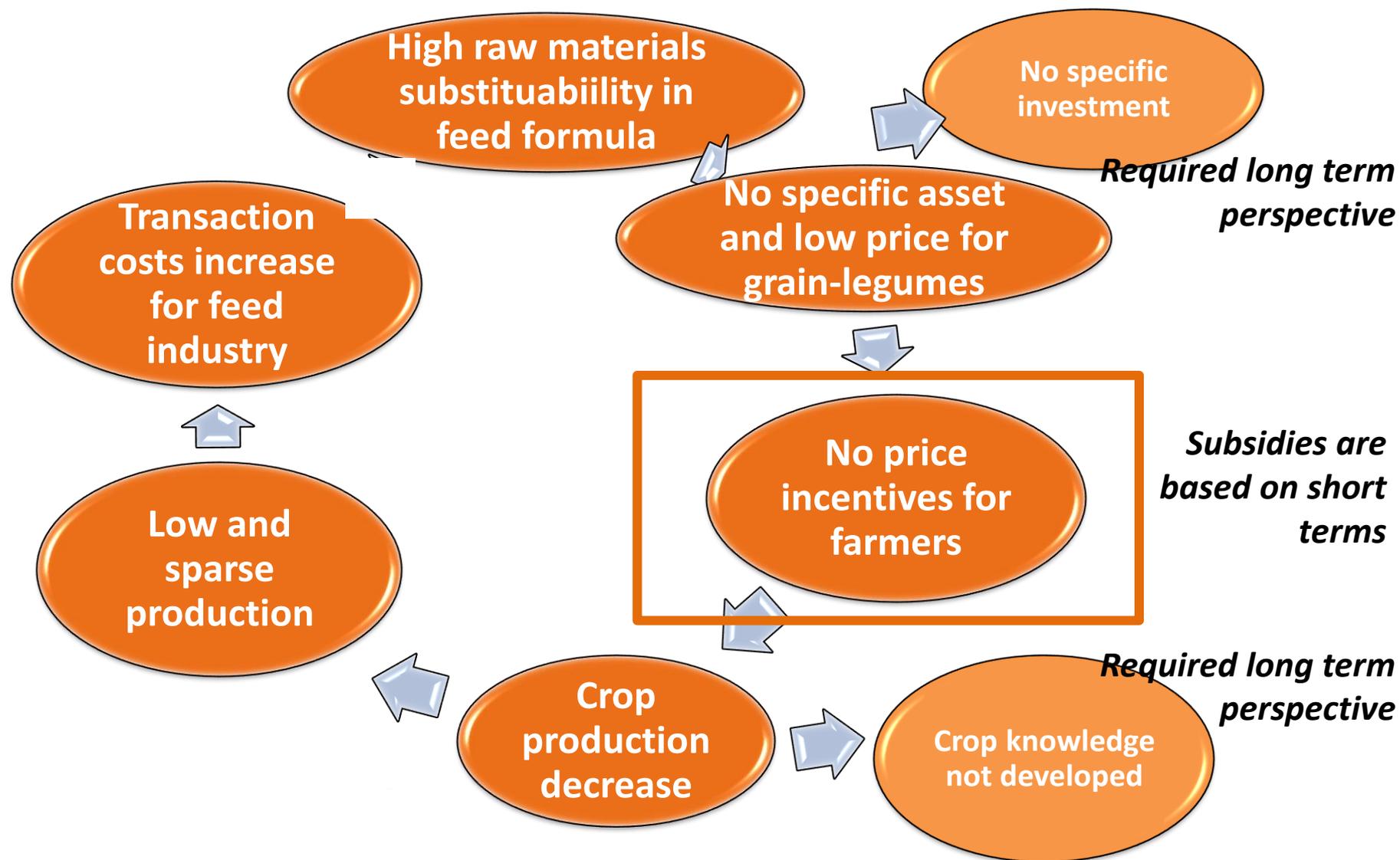


How to collectively organisation volume markets ?

Failure of previous European « Protein Plans »



Failure of previous European « Protein Plans »



Failure of previous European « Protein Plans »

High raw materials
substituability in feed
formula

Spot feed market is not a stable market

to foster long-term investment for minor crops

- **Quality Label in feed** could help develop minor protein crops : Organic label, « without GMO », « label rouge »... **but there are niche markets**, so it will take time to develop «increasing returns to adoption»...
- **innovations in food are also major levers to stabilize investment on those crops and to increase prices...**

Crop
production
decrease

Feed/Food chains - high value, specialised markets some examples from France

PEA for food : from commodity markets to hybrid form with production contracts with Roquette ?

FABABEAN, LINSEED (not protein crop) on feed high-value chain : hybrid form with production contracts between cooperatives and feed processor (VALOREX) – “BBC value chain”

LUPIN (food) : integrated SC with the cooperative TERRENA (Capital own 100%)

RAPESEED oil for food (omega-3 value chain “Fleur de Colza”) : hybrid form with production contracts... but meals on commodity markets

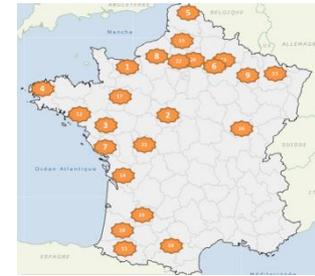
SOYA for food : hybrid form with production contracts between cooperatives and food processors (Nutrition&Santé, Triballat...)

....

New on pulses : quasi-integrated SC between a cooperative QUALISOL and a industry NUTRINAT (majority of capital owned by the cooperative)...

Preliminary study in the field crop sector , with the TOP20 french cooperatives

Semi-structured interviews with collect or commercial responsables



Conclusion :
which questions tackle in sessions ?

Are we facing high value or commodity markets ?

Depending on transactions attributes, and so on transaction costs !

How the SC is dependent on imports (on international price markets) ?

Which “business innovations” ?

In what way added value is created? By-product strategy? *Oil/protein ;starch/protein*

Which actors are concerned ? What is the governance structure of transactions ?

Which contracts used? Are there association or other collective organizations....

If in a high value market, which differentiation strategy is used ?

Is there a label ? If specific standards exist? could they be generalized ? Are there specific contracts ? How prices are set ? How prices are negotiated ?

What must be learned to develop the SC (learning process) ?

Crop cultivation knowledge needed ?

Crop qualities improvement depending on processing ?

Which collective contractual governance is implemented to develop the SC?....

Which new standards to promote to create specific assets ?

GHG reduction, healthy feed/food (ex: omega-3), local sourcing, GI...

At which territorial scale the collective governance of the SC must be implemented (at least at the emerging phase) ?.....

Thanks for you attention

Selected references

Cholez C., Magrini M-B., Galliano D., Forthcoming 2018, Collective contractual governance and interfirm knowledge exchange: the case of production contracts for developing a new crop supply chain , Organization and Environment.

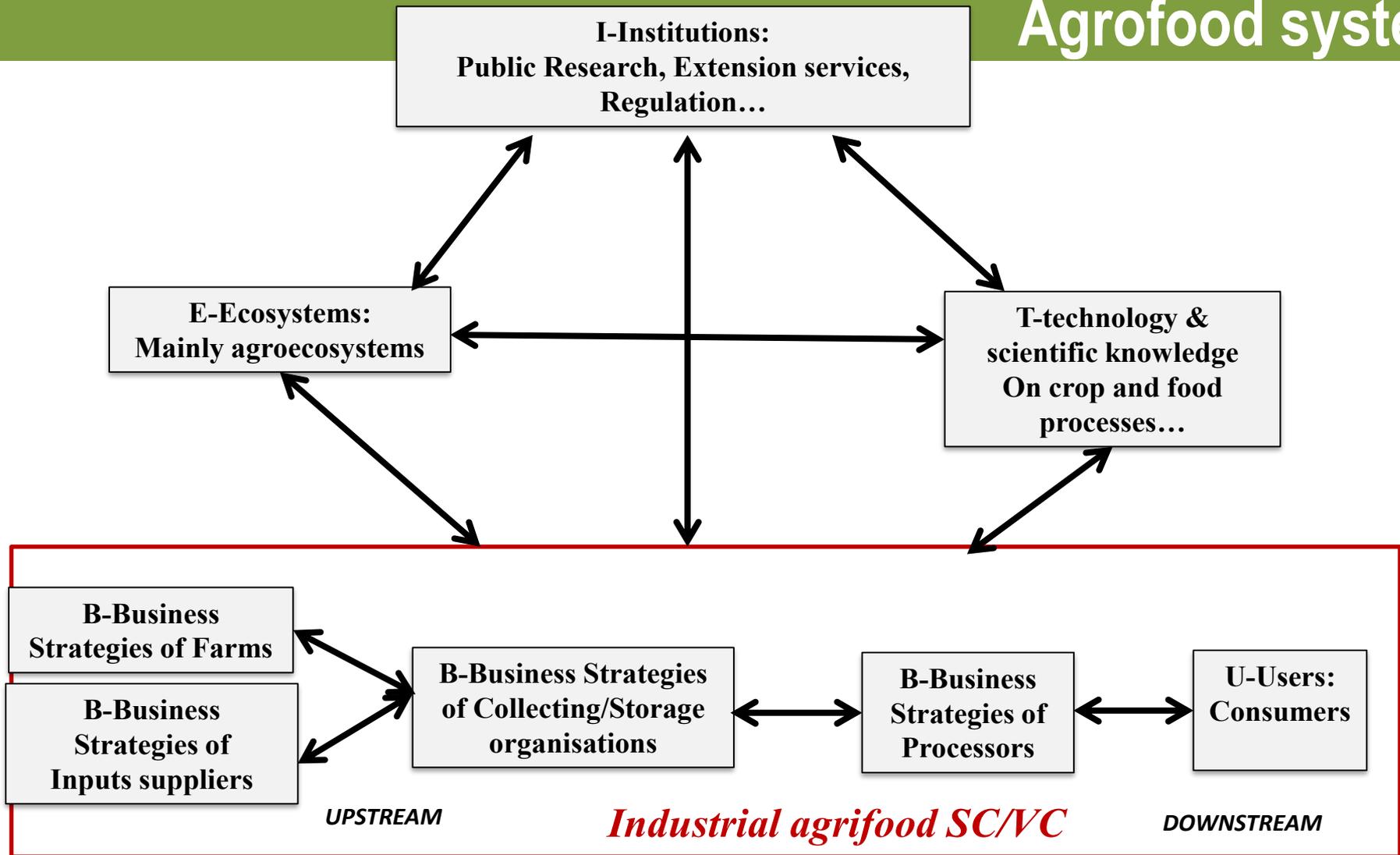
Cholez, C., Magrini, M.B. and Galliano, D., 2017. Field Crop Production Contracts. Incentives and Coordination under Technical Uncertainty, in French Cooperatives. *Économie rurale*, (4), pp.65-83.

Magrini M-B, Befort N., Nieddu M., Forthcoming 2018, Economic dynamics of technological trajectories and pathways of crop diversification in bio-economy in Lemaire, Recous, Kronberg, and Carvalho (eds). *Agro-ecosystem Diversity: Reconciling Contemporary Agriculture and Environment Quality*, Elsevier ed.

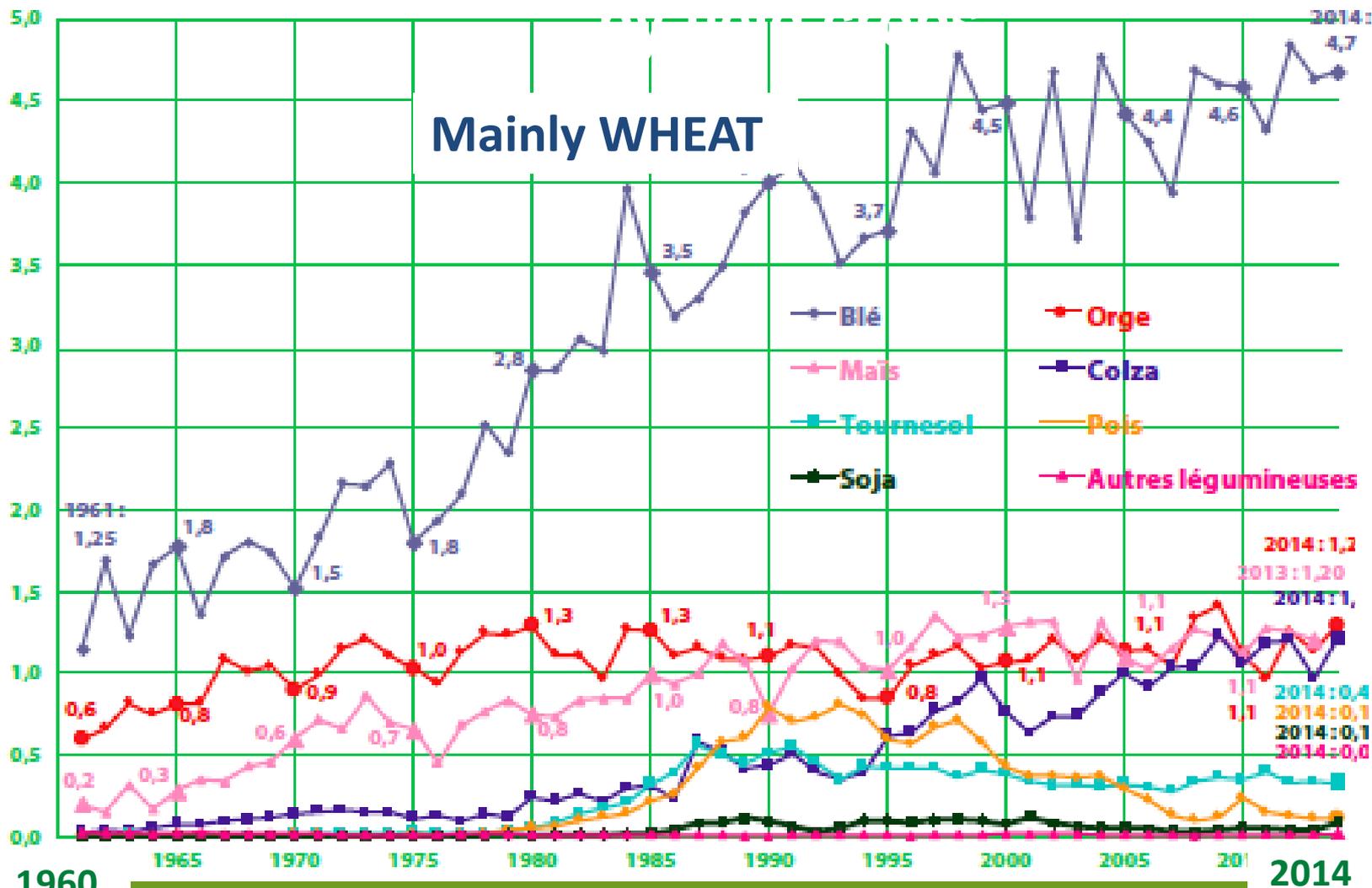
Meynard J.M., A. Messéan, A. Charlier, F. Charrier, M. Fares, M. Le Bail, M.B. Magrini, I. Savini, 2013. Crop diversification: obstacles and levers. Study of farms and supply chains., Synopsis of the study carried out by INRA at the request of the ministries in charge of Agriculture and Ecology, INRA, 62p.

<https://www6.paris.inra.fr/depe/Media/Fichier/Etudes/Diversification-des-cultures/synthese-anglais>.

Ménard, C., 2018. Organization and governance in the agrifood sector: How can we capture their variety?. *Agribusiness*, 34(1), pp.142-160.



The French case : the evolution of protein production among field crops



New dev.
RAPESEED

Little dev.
SUNFLOWER

Soya
Other grain-
legumes

1960

2014

Grains properties

Protéines

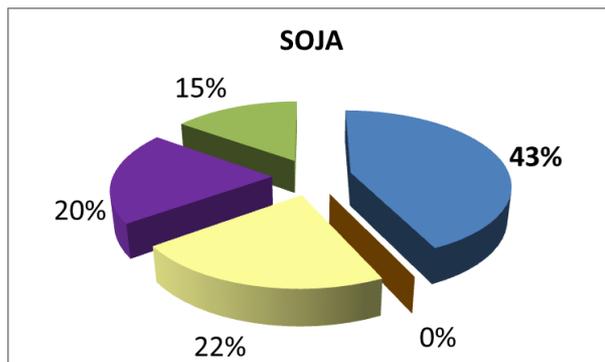
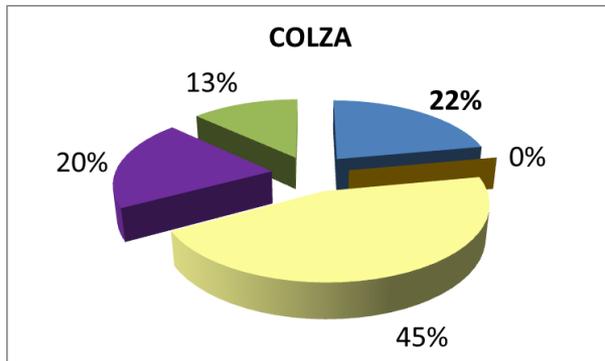
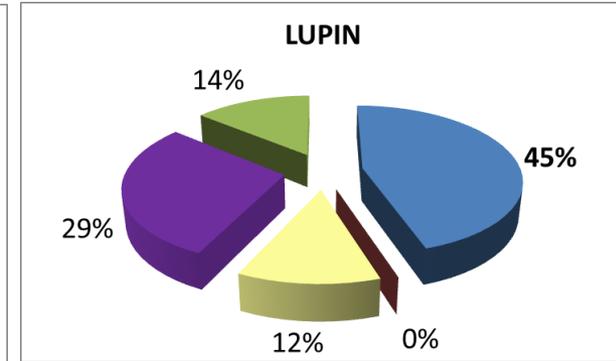
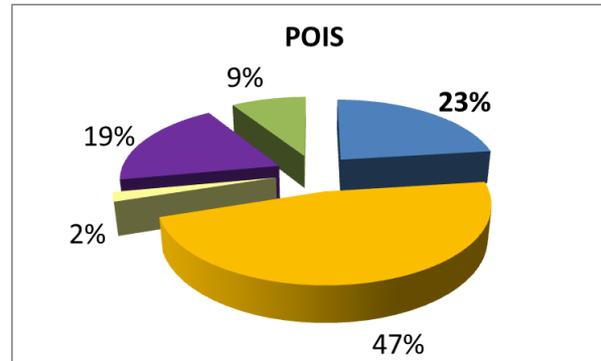
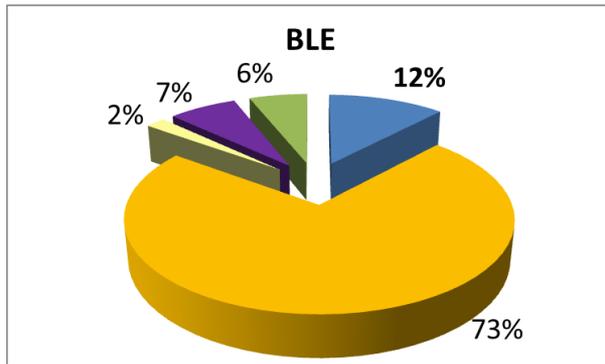
Lipides

Divers



Amidon

Fibres



| | Albumines | Globulines | Prolamines | Gluténines |
|------------|---------------|-------------------|--------------|------------|
| solubilité | eau | solutions salines | alcool 70°GL | pH > 11 |
| rôle | physiologique | <----- | réserve | -----> |
| soja | 10 | 90 | - | - |
| lupin | 10-20 | 80-90 | - | - |
| féverole | 20 | 60 | - | 15 |
| pois | 20 | 65 | - | 15 |
| tournesol | 20 | 60 | 5 | 15 |
| colza | 50 | 25 | 5 | 10 |
| blé | 5 | 10 | 45 | 40 |

NEW MEETING BETWEEN ALL ACTORS OF THE SUPPLY CHAINS AND RESEARCH

→ To foster exchanges, knowledge transfer, choices of priorities in research...
between all the stakeholders

Pour la terre et les hommes,
les légumineuses
au cœur de l'innovation

2^e Rencontres Francophones sur les Légumineuses

17 & 18 octobre 2018 à Toulouse - France

Échanges scientifiques, techniques et professionnels – Rdv d'affaires



Co-organized by



With support from



Avec le soutien de

