

Innovation and agriculture 4.0: impact on the food supply chain

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Workshop Innovation and Market Power in the Food
supply chain:

challenges for competition policy and regulation
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Opening remarks

- An introduction from an academic lawyer
- Innovation and agriculture 4.0:
 - a technological, digital and social revolution to feed the world facing the food, climate and trade challenges
 - a revolution in order to achieve or to jeopardize objectives of CAPs (art.39 TFUE): fair incomes for producers and insure right to adequate food for consumers?

Outline

- **Agriculture 4.0: definition**
- **Supply chain** : the actors & stakeholders
 - Producers
 - Industry/transformation
 - Retailers/distribution
 - Consumers
- **The impact for the supply chain:** opportunities and risks

1. Agriculture 4.0: General overview

What is farming 4.0:

- According to the European Parliament: «a farming management model based upon observing, measuring and responding to inter and intra field variability in crops»
- In plain words we could say «to produce more and better with less using technologies and in particular big data analytics»
- Precision agriculture based on internet of things(IoT): for example using devices capable to send data related with crops, measuring several parameters affecting the growth, the soil moisture, temperature... The data in real time: a tool for monitoring crops, for developing statistical models, or predicting when watering ..., for reducing pesticides use...

1.1. Agriculture 4.0: bringing a revolution to the methods and processes

- Innovation and technologies are bringing a revolution in the methods and processes at each step of the food chain. For all actors, it requires investments and skills, and for some of them a social and ethical acceptability
- According to the EU Commission , farming 4.0 is the best way «to face societal challenges» (as shown by the former key note): food , climate and environmental challenges, and also economic challenges in order to establish a sustainable and competitive production of food»
- Still according to the Commission, it should also be an opportunity to face 2 other crucial social challenges: on one hand, to produce food in accordance with the consumers preferences (safe, high quality and sustainable food...); on the other hand, to produce more and better in order to ensure fair incomes (and fair share value) for farmers

1.2. Agriculture 4.0: a revolution across the whole supply chain up to consumer

- Innovation is changing processes: data collectors, communication machine to machine improve the logistics and the speed food production and food retailing
- Up stream: integration of innovations in the agro-bio-chemical industry needs more investments, more concentration (as the panelists will demonstrate), more collaboration/cooperation between operators and more vertical integration
- Farmers: new skills (for managing data and informations..), new tools, investments...
- Industry: cf. Barilla, developing innovative products (better information system, risks management tools)
- **Introduction of new «players»** in the supply chain for example: platforms and GAFAM

2.1. The food supply chain: diversity of interests and asymmetry of market power

- Before exploring the impact on the supply chain, it seems necessary to make some remarks about the characteristics of the food supply chain:
 - Diversity of interests, diversity of cultures and social preferences
 - Unbalanced supply chain, asymmetry of contractual and market power along the food chain
 - Upstream is concentrated: high level of concentration of the agro/bio/chemical industries
 - Transformation and distribution: high level of concentration, important market power
 - Farmers/producers: atomicity, problem of concentration of the offer (highlighted by numerous studies and reports), they are price takers, weakest link of the food supply chain: since the market oriented CAP and the liberalization of trade, their incomes are decreasing, farmers are suffering a declining share of added value in the food chain
 - Consumers: great expectations in terms of healthy, safe, sustainable products, also expectations regarding transparency (food processing, social and ethical concerns..), short supply chain, local food, and affordable prices

2.2. The food supply chain: opportunities and risks

- Benefits and opportunities in academic and institutional literature: (Zamboni & al, Process 2019, EU Comm, EU parliament) upstream and down stream will benefit of farming 4.0
- It will «reinforce the position of European agriculture as a competitive and resource efficient sector» and then improves the competitiveness and the profitability of each actor of the food supply chain (economy of resources, water, less losses and waste, developing new products and production , better responding to consumers'expectatives and concerns...), tools of management of risks...
- In fact, innovation increases information and transparency: better communication between actors (but it could also reinforce the dependency of primary producers and SMEs)
- Better transparency could (should) contribute to a better transmission of the price transmission and contribute to a better sharing value along the food chain
- Connecting farmers to consumers: creation of new markets, shorts supply chain increasing profitability for farmers

3. The impact for the supply chain: rebalancing the food chain?

- Agriculture 4.0: a new pattern able to counterbalance the asymmetry of contractual and market power (and to achieve the objectives of CAPS)? The position of farmers must be strengthened (reinforcing concentration of supply - the offer - through cooperatives, OP/AOP, with aids and subsidises in the future CAP...)
- The panels of this afternoon will analyze the impact on supply chain in the light of regulation and competition policy, and e-commerce
- This first panel will explore it from an empirical perspective

Agriculture 4.0: main issues

- This first panel will focus on the impact of innovation on the industry (new business models, concentration issues, vertical integration and cooperation), covering the following topics:
 - **Concentration in the food chain (K. Deconinck, OECD)**
 - **Concentration in agrochemical and innovation: the difficulty of balancing the supply chain (M. Caldana)**
 - **Barilla's experience in innovation (L. Mirone)**
 - **Digital farming: opportunities and risks for small and medium farmers (N. Reynolds)**