



# New trends in society and food systems with possible impact on the safety of the food chain

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# Rationale

- Bioeconomy
  - beyond substitution of fossil-fuels with bio-based materials
  - embraces concepts such as recycling, circular economy
  - challenges to existing food safety practices and legislation
- Examples from SCAR Foresight Exercise 4 and VMM Systems analysis

# VMM Systems Analysis (2012)

- To identify **driving forces** and **systems dynamics** affecting the vulnerability of our food system
- To identify **niches** able to increase the resilience of our food system
- To support the **transition** to a more **sustainable** agricultural and food system in Flanders



# 4th SCAR Foresight Exercise (2015)

- To identify **emerging research questions**
- To anticipate future **innovation challenges**
- To support the implementation of the European **Bioeconomy strategy**
- To explore what might happen by developing the Bioeconomy Paradigm within the fundamental constraint of **sustainability**



# The bioeconomy strategy

In 2012 EC launched the strategy for “Innovating for sustainable growth: A bioeconomy for Europe”, aiming *“to pave the way to a more innovative, resource efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection”*.

# The bioeconomy concept

- Bio-economy or bio-based economy “... encompasses the production of **renewable resources** and their conversion into food, feed, bio-based products and bio-energy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries” (EC, 2012)
- However, bio-economy is more than simple addition of sub-sectors: set of existing relations between human societies and the **biosphere** in several aspects:
  - provision of goods and services,
  - emission of pollutions and negative externalities
  - but also of positive externalities
  - in order to keep biosphere capacities and functionalities viable and sustainable for future generations.

# Two premises

1. Biomass **is underexploited**:
  1. Too much waste not used optimally
  2. More material and energy can be extracted from current biomass streams
2. The biomass potential **can be upgraded** by
  1. Closing yield gaps
  2. Introducing new or improved species
  3. Introducing new and improved extraction and processing technologies

# Potential benefits and concerns: values

- Predominantly positive perception
- Concerns:
  - global food security and resource overexploitation (LDCs)
  - tension between policy focus on quality production and rural development versus cheap biomass as feedstock for non-food uses
  - impact of large-scale exploitation of feedstocks on primary sectors



# Five key principles for a sustainable bioeconomy

- **Food first:** ensure the primacy of food security
- **Sustainable yields:** amount harvested < regrowth → agriculture?
- **Cascading approach:** sequential use of biomass according to 'value added'
- **Circularity:** reduce/reuse/recycle
- **Diversity:** systems are diverse, using context-specific practices at different scales, producing a diversity of outputs

# Signal 1: The circular economy: synergy or trade-off between safety and environment?

A circular economy is

“... an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems and business models”

(MacArthur Foundation, 2014).

# Principles of the circular economy

1. Ideally waste does not exist, as products are designed for a cycle of disassembly and reuse
2. Distinction between
  - **Consumables:** to be returned to the biosphere without harm after *cascading* sequence of uses, contributing to its restoration.
  - **Durables:** designed to maximise reuse or upgrade. To encourage the circularity of durables, these products are leased, rented or shared rather than sold, so that the owner will have the responsibility of retiring them after use and starting a new cycle.
3. Use of renewable energy to fuel the process

# Circular economy and biomass

- Cascading use of biomass: food versus energy
- Synthesis of food components based on waste or by-products of the food chain (e.g., protein from manure or grass)
- Recycling of phosphorus and other elements from sewage systems
- Use of 'waste streams' in the food chain

Using waste and by-products as input for food production is strictly regulated for reasons of food safety. The implementation of the bioeconomy may put pressure on these regulations.

# Signal 2: Ecological intensification of agricultural production

- Using regulating functions of nature (functional ecology)
- From input substitution (e.g. predator instead of pesticide, biomimicry, new molecules) to landscape-level agroecosystem design
- From mono-species/environment studies to the study of groups of organisms in relation to each other and the environment (community ecology)
- To be supported by –omics and big data

Use of natural compounds instead of synthetic compounds → may have food safety implications that may not yet be fully understood

# Signal 3: Urban agriculture, short supply chains and the sharing economy

- The rise of the **prosumer**: consumers take on activities previously carried out by producers
- New movement of alternative economy
  - Sharing
  - Peer-to-peer
  - Repair shops
  - Collective gardening

Consumer-to-consumer interactions challenge many existing regulations related to tax laws, labour laws, but also food safety regulations

# The landscape

- Community Supported Agriculture
  - since 2007
  - 19 established, 6 planned
  - appr. 3000 members
- Fermet/De Fermetisten
  - since 2015
  - first transformation
- Food Hubs
- Home delivery market
- Thuisafgehaald.be (shareyourmeal)



Zoek op postcode en plaats (bijv. 2000, Antwerp)

Zoeken

Kaart

Satelliet



### Begin met zoeken

Zoek naar maaltijden en koks bij jou in de buurt.

## Vandaag af te halen

in heel België



**Courgettesoep** Soep door [Vegan Lilly](#)

Romige, kruidige courgettesoep. Perfect op een grijze pre-herfstdag! ;)

Antwerpen | 3,00 € | 17 september tussen 19:00 en 20:00



**spaghetti bolognese**

Hoofdgerecht door [bij Anaïs](#): eenvoudig en huiselijk

Spaghetti overschot voor 1 persoon (grote eter). Vandaag bereid. Ingredienten: gehakt, ui, wortelen, tomaat, lenteui, kruiden. Kaas ook beschikbaar.

Merksem | 3,00 € | 17 september tussen 17:00 en 20:00



**Penne met boschampignons en truffelolie**

Hoofdgerecht door [Vegan Lilly](#)

Penne met verse, kruidige boschampignons en zwarte



# Het spilvarken...



Source: [www.hetspilvarken.be](http://www.hetspilvarken.be)

# Signal 4: Changing paradigms in nutrition science

- Increasingly nutrition scientists prescribe to avoid as much as possible processed and fast foods and to eat as **diverse** as possible. The reason is that obesity and many diseases are in fact related to the composition of our **gut microbes** (Spector, 2014).
- A recent study published in Science revealed that farm dust protects children against **allergy** and **asthma** (Schuijs et al., 2015). So, the cure is to get exposed **more** to microbes, not less.

These insights question our understanding of and ask for a redefinition of the concept of 'hygiene'