Delivering on EU Food Safety and Nutrition in 2050 -

Future challenges and policy preparedness
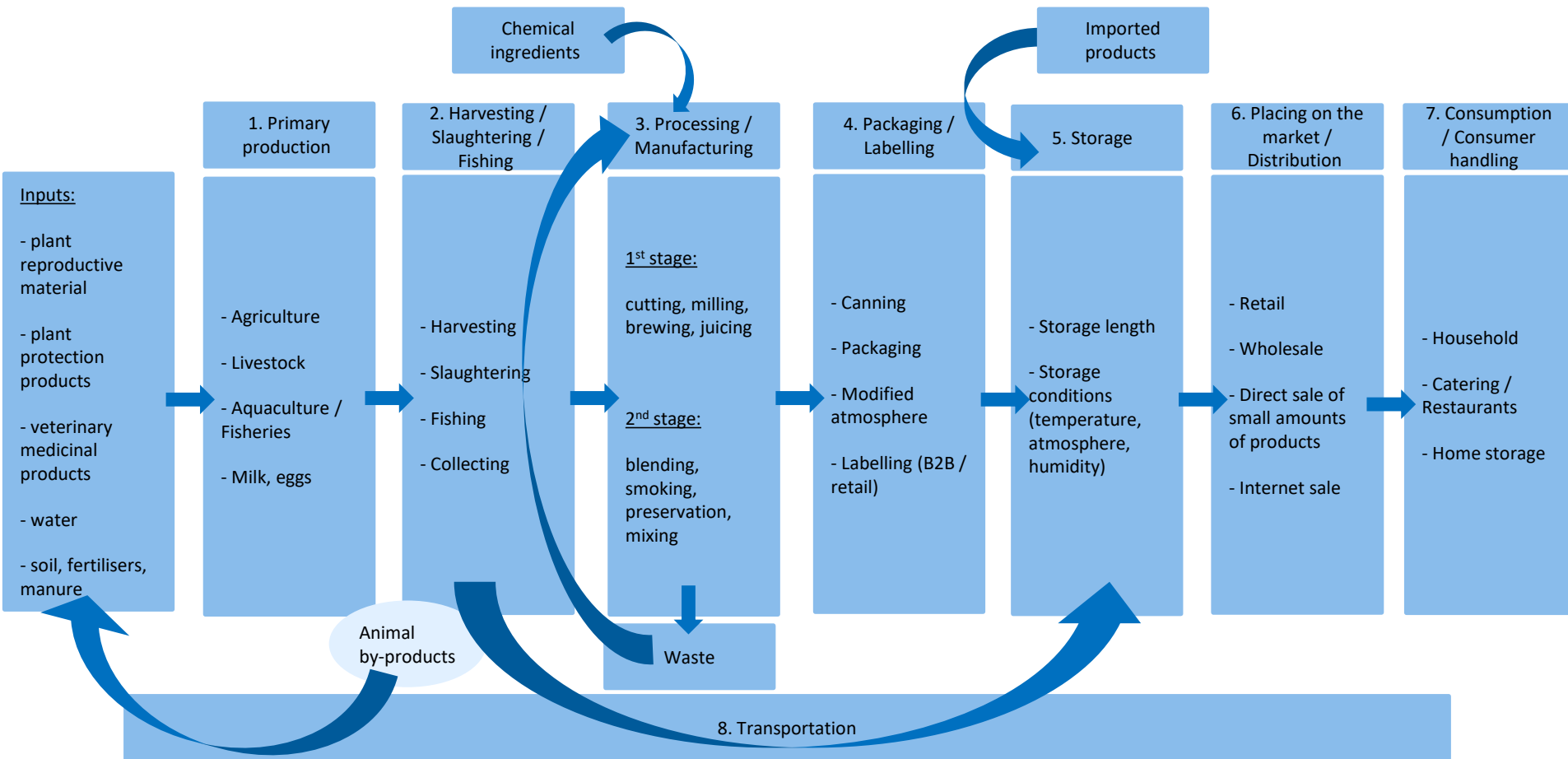
FOOD SAFETY AND NUTRITION

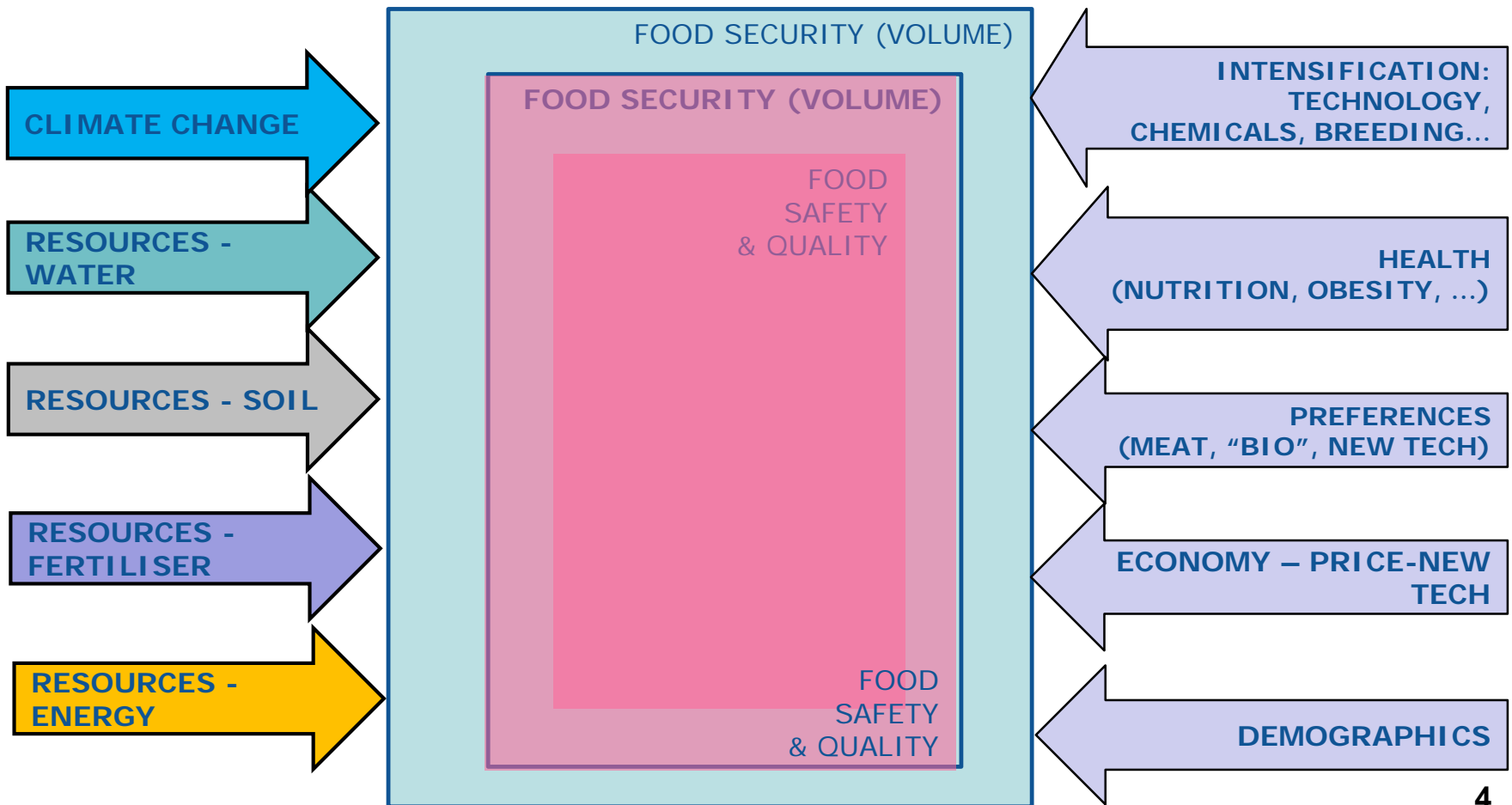➢ *OBJECTIVE OF EU POLICY AND LEGISLATIVE FRAMEWORK:*

> „*Provision of safe, nutritious,*
> *high quality and affordable food*"

➢ **High variety of foods available in EU**

➢ **Food was never so safe as today**

➢ **Single market, harmonised approach, shared legislative framework**

➢ **Trends: more information, lower limits, stronger control, more technology ....**

THE FOOD CHAIN SYSTEM OVERVIEW

Chemical ingredients

Imported products

1. Primary production

2. Harvesting / Slaughtering / Fishing

3. Processing / Manufacturing

4. Packaging / Labelling

5. Storage

6. Placing on the market / Distribution

7. Consumption / Consumer handling

Inputs:

- plant reproductive material

- plant protection products

- veterinary medicinal products

- water

- soil, fertilisers, manure

- Agriculture

- Livestock

- Aquaculture / Fisheries

- Milk, eggs

- Harvesting

- Slaughtering

- Fishing

- Collecting

1st stage:

cutting, milling, brewing, juicing

2nd stage:

blending, smoking, preservation, mixing

- Canning

- Packaging

- Modified atmosphere

- Labelling (B2B / retail)

- Storage length

- Storage conditions (temperature, atmosphere, humidity)

- Retail

- Wholesale

- Direct sale of small amounts of products

- Internet sale

- Household

- Catering / Restaurants

- Home storage

Animal by-products

Waste

8. Transportation

3

FOOD SAFETY IN FUTURE – IS IT FOR GRANTED?

FOOD SECURITY (VOLUME)

FOOD SECURITY (VOLUME)

FOOD SAFETY & QUALITY

FOOD SAFETY & QUALITY

CLIMATE CHANGE

RESOURCES - WATER

RESOURCES - SOIL

RESOURCES - FERTILISER

RESOURCES - ENERGY

INTENSIFICATION: TECHNOLOGY, CHEMICALS, BREEDING…

HEALTH (NUTRITION, OBESITY, …)

PREFERENCES (MEAT, "BIO", NEW TECH)

ECONOMY – PRICE-NEW TECH

DEMOGRAPHICS

IS OUR FOOD SYSTEM FIT FOR FUTURE CHALLENGES?

➢ *Food security studies/foresights: gap in food safety ("integral part")*

➢ *Are we sure that our direction/development is right and sustainable?*

➢ *Foresight analysis on "Delivering on Food Safety and Nutrition in 2050" to:*

- ▪ *Identify the critical challenges*
- ▪ *Assess their impact on food (safety) policy framework*
- ▪ *Define the potentially critical changes necessary to maintaining the standards of food safety and nutrition*
- ▪ *Provide insight and guidance towards the development of future policy responses and research needed to support EU policy response to these challenges*

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PHASE I OF THE FORESIGHT ANALYSIS

*Scoping study on „**Delivering on EU Food Safety and Nutrition in 2050-Scenarios of future change and policy responses identifying critical drivers and future scenarios**"*
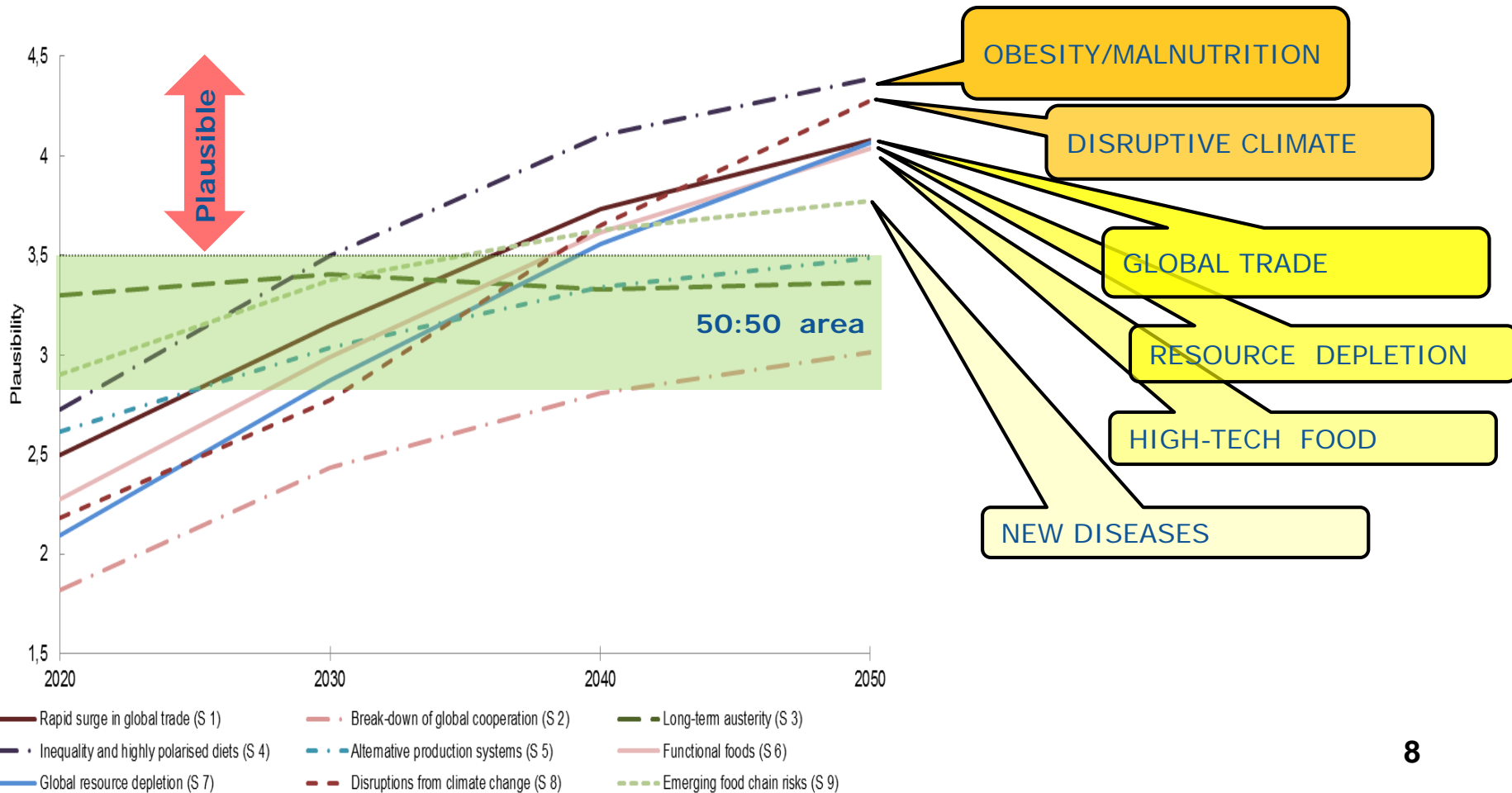
➢ **METHODOLOGY/APPROACH:**

- *Out of box approach, no desired results pre-defined, disruptive futures considered*

- *Identification of drivers and pre-scenarios*

- *Test of plausibility*

- *Definition of unknown – right questions for further work and for research*

PHASE I: Drivers and pre-scenarios

Driver	Category
Rapid surge in global trade, high concentration of agri/food industries	GLOBAL ECONOMY AND TRADE
Break-down of global cooperation, multipolar world	COOPERATION AND STANDARD SETTING
Long-term austerity, shift to private food safety controls	EU GOVERNANCE (FAILURE)
Severe inequality linked to food insecurity of vulnerable	DEMOGRAPHY AND SOCIAL COHESION
Strong shift of consumer preferences – food from alternative production systems	CONSUMER ATTITUDES: ALTERNAT. FOOD CHAINS
Wide-spread consumption of high-tech foods	CONSUMER ATTITUDES: NEW FOOD TECHNOLOGIES
Global source depletion (absence of minerals, water etc.)	COMPETITION FOR KEY RESOURCES
Global disruptions of agriculture from climate change	CLIMATE CHANGE
Break-down of consumer trust in food following the emergence of food chain risks (new diseases etc.)	EMERGING BIO-RISKS AND DISASTERS

PLAUSIBILITY OF PRE-SCENARIOS
(1=not plausible to 6=highly plausible)

Plausible

4,5
4
3,5
3
2,5
2
1,5

Plausibility

50:50 area

2020   2030   2040   2050

OBESITY/MALNUTRITION

DISRUPTIVE CLIMATE

GLOBAL TRADE

RESOURCE DEPLETION

HIGH-TECH FOOD

NEW DISEASES

— Rapid surge in global trade (S 1)   — • Break-down of global cooperation (S 2)   — • Long-term austerity (S 3)

— • Inequality and highly polarised diets (S 4)   — • Alternative production systems (S 5)   — Functional foods (S 6)

— Global resource depletion (S 7)   — — Disruptions from climate change (S 8)   ····· Emerging food chain risks (S 9)

PHASE II OF THE FORESIGHT ANALYSIS

(IN COLLABORATION WITH THE JRC)

- ➢ *Consolidation of scenarios* *focusing on their interdependences and **identification of their impact** on food safety and nutrition in the EU*

- ➢ *Assess the capacity of the EU's current food policy instruments (compliance, control and enforcement) to **respond successfully to the challenges***

- ➢ *Identify appropriate (optimal) policy responses, transition pathways and the **requisite research** for the development of a future food safety and nutrition policy and legislative framework necessary to safeguard the high standards of safe, nutritious, high quality and affordable food for EU consumers*

DRIVERS USED FOR SCENARIO BUILDING

Social cohesion

EU economic growth

Technology uptake

Global trade

Food values

EU food chain

Agro-food industry structure

Natural resource depletion

Global population growth

Climate change
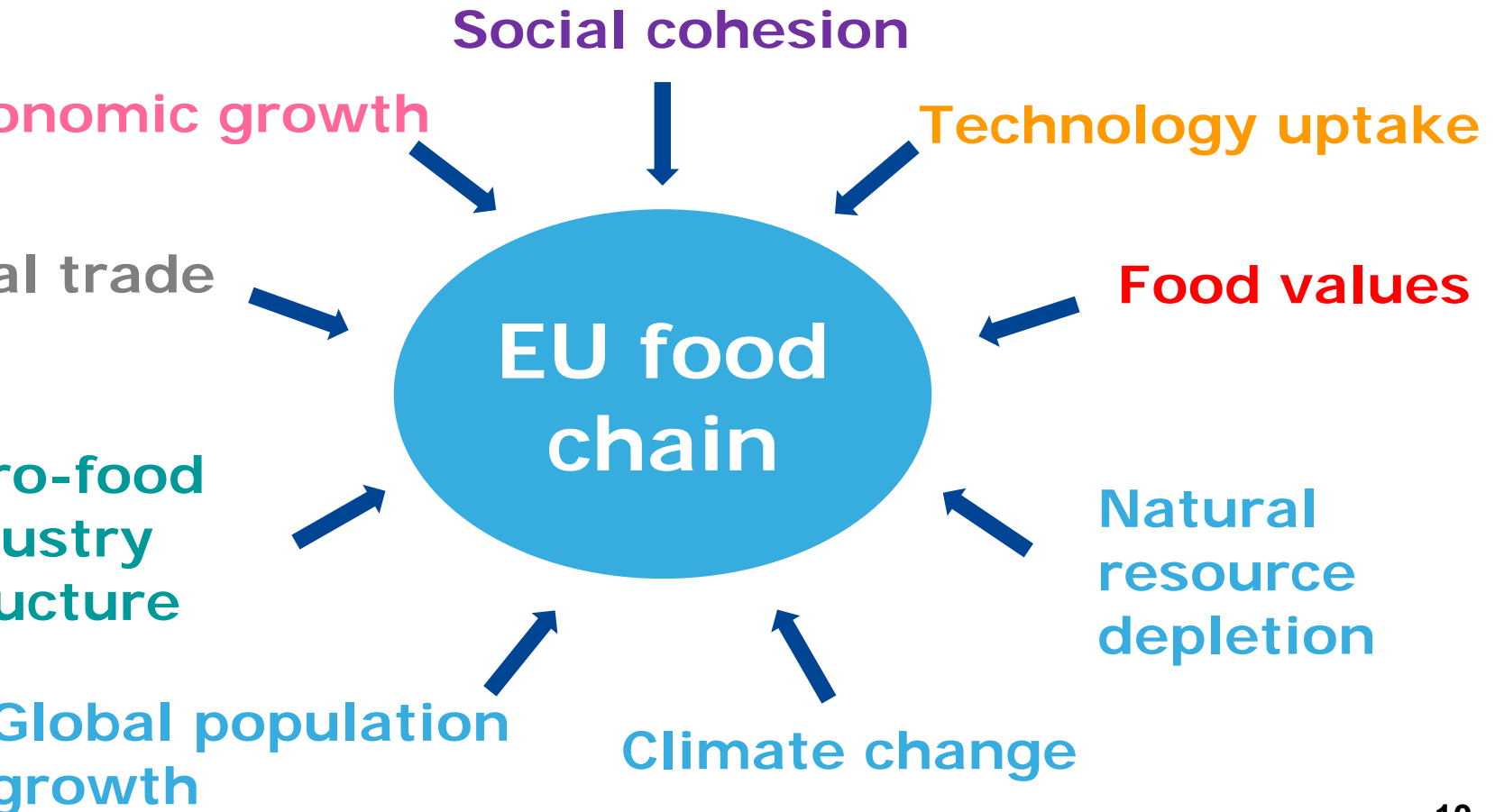
Scenarios

Local/Regional Food
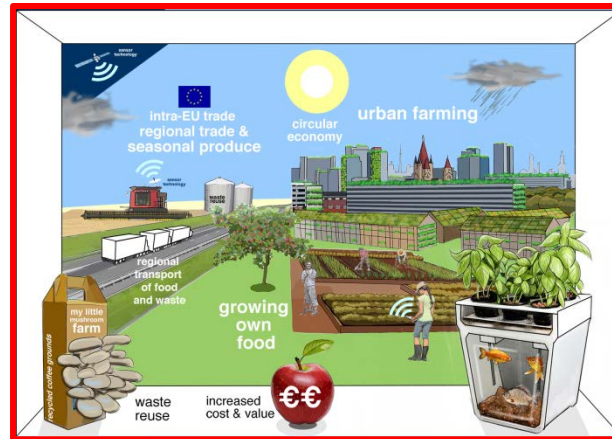
Global Food

Pharma Food

2050 ?

2016
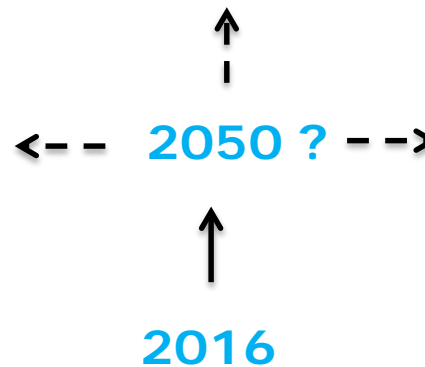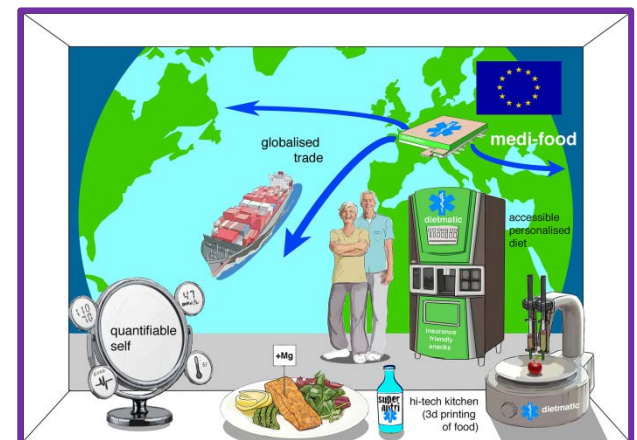
Global Food

- Liberalised trade and global food chain
- EU one of many players
- Raw materials sourced globally– long complex food chains

- **Broad technology acceptance**

- **Concentration of agro-food industry; mass production of processed, affordable foods**

- **Diets driven by price, taste, convenience**

- **Health and Social Inequalities**

- **Natural resources depletion, global population growth**

Local/Regional Food

- Localisation/regionalisation/ homesteading

- Technology for sustainable use of resources

- Mix of large entities and localised food production

- High social value of food; diets low in animal protein

- Strong sense of communal values and community responsibility

- Natural resources depletion global population growth
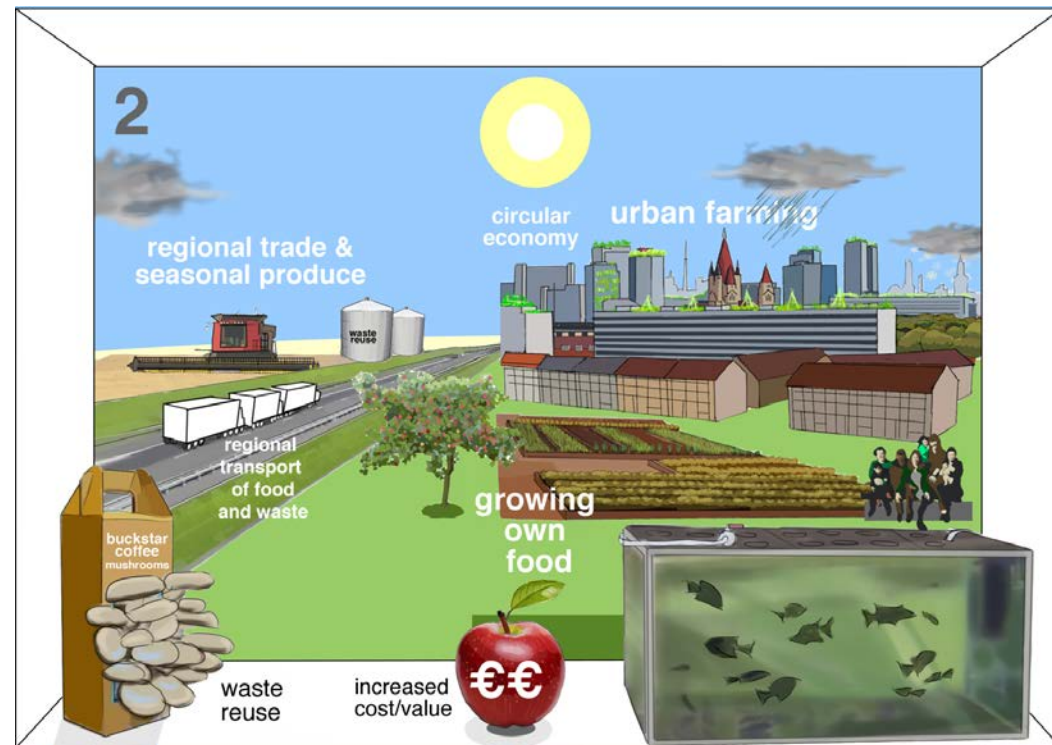
Pharma Food

- High-tech world – maximise Healthy Life Years, Climate Change adaptation, diversity

- "Phood": Pharma & food sectors converge + ICT; concentration

- EU is a strong player worldwide

- Global trade and global food chains

- Health is the main driver for food choices, personalised nutrition

- Social well-being?

- Natural resources depletion, global population growth
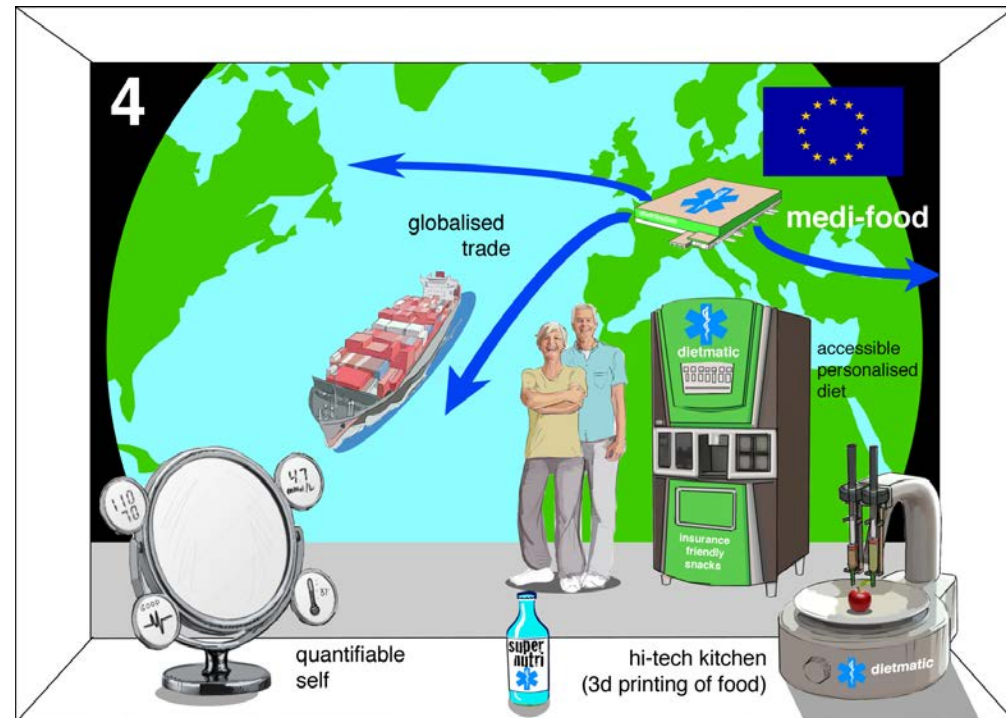
Driver characteristics per scenario

Driver	"Global Food"	"Local Food"	"Pharma Food"
Global trade	Full liberalisation	Disrupted and fragmented	Full liberalisation
EU economic growth	Medium	Decoupled, GDP no longer used as indicator	High
Agro-food chain structure	Concentration	Diversification, alternative food chains	Concentration
Technology uptake	High	High with focus on environmental sustainability	High with focus on nutrition & health
Social cohesion	Low	High	High
Food values	Low	High with focus on local production & quality	High with focus on nutrition & health
Climate change	2°C threshold of temperature increase to be reached by 2050		
Depletion of natural resources	Progressive natural resource depletion towards 2050		
World population growth	World population will increase to about 9 billion by 2050		

Global Food: prioritised challenges

Main Prioritised Challenges
Differences in the handling of food in third countries due to diverging food safety standards
Suitability of the current EU risk assessment procedures for new food ingredients, food products and food-related technologies (including suitability of exposure data and current maximum residue levels)
Ability to perform official food-related controls
Increased sedentary behaviour and snacking due to changed lifestyles *&* *Diets based predominantly on highly processed foods and decreased availability of fresh produce*
Provision of complex quality labelling information to the consumer and opportunity for fraud

Global Food: Policy & IT challenges (1/2)

Main Prioritised Challenges	Potential policy options	IT Challenges & Solutions
Differences in the handling of food in third countries due to diverging food safety standards)	Build efficient food safety standards with implementation details	Publication-maintenance of food safety standards using machine readable expressions
	Co-regulation or enforced self-regulation by food business operators	Secured mandatory digital tracking and tracing of food flows stored and guaranteed by trusted third parties (machine auditable by the control authorities in case of issues)
Suitability of the current EU risk assessment procedures for new food ingredients, food products and food-related technologies (including suitability of exposure data and current maximum residue levels)	Enhance collaboration between risk assessment bodies	More online collaboration. Compilation-Exchanges of data on analysis & assessment results in order to be able to assess or re-assess on semi-automated way using different assessment models
	Horizon scanning to identify vulnerabilities in the supply chain	Secured mandatory digital tracking and tracing of food flows stored by trusted third parties (machine auditable by the control authorities in case of issues)
Ability to perform official food-related controls	Long-term funding mechanisms	NA
	Expand third country controls	Extension to third countries of the secured mandatory digital tracking and tracing of food flows stored by trusted third parties (machine auditable by the control authorities in case of issues)
	Enhancing surveillance to ensure food safety during transportation	Generalisation of intelligent labelling and packing-packaging recording parameters from farm to fork
	Improving traceability using related technologies	RFID, interoperable international standards enforced and secured mandatory digital trace and track stored and guaranteed by trusted third parties

Global Food: Policy & IT challenges (2/2)

Main Prioritised Challenges	Potential policy options	IT Challenges & Solutions
Increased sedentary behaviour and snacking due to changed lifestyles *&* *Diets based predominantly on highly processed foods and decreased availability of fresh produce*	Fiscal measures	NA
	Food reformulation and other incentives	Historisation of digital labelling data in order to show publicly evidences of gradual reformulations
	Zoning and other limitations	Digital mapping of key elements defining the zoning and other limitations linked with expert geographical alert system
	Standards and guidelines for public procurement	NA
	Funding of national and European food and diet related actions	NA
	Improve nutrition education	My connected fridge does give me advices on how to best use its content and what to buy to improve my nutrition balance
	Improve the provision of nutrition information	Digital repository on labelling of product made available to Apps or other devices allowing an automated dietary follow-up for the individual.
Provision of complex quality labelling information to the consumer and opportunity for fraud	Harmonisation at international level	Harmonisation of exchange structure on labelling. Mandatory digital publication of data from labels (machine readable formats) by the suppliers importing or producing in EU in order to 'feed' personal monitoring apps or information systems

Local/Regional Food: prioritised challenges

Main Prioritised Challenges
Food safety responsibility in the hands of individual producers
Failure to provide appropriate food safety information to the consumer
Re-introduction of food waste and organic side-stream products in the food chain
Temporary shortages of fresh produce and food poverty in a self-sufficient food system

Regional Food: Policy options & IT challenges (1/2)

Main Prioritised Challenges	Potential policy option	IT Challenges & Solutions
Food safety responsibility in the hands of individual producers	Expansion of the scope of the General Food Law and hygiene regulations and the related control implications to individual food producers	Effective digital realtime traceability including product treatments. Keeping buyer's contact is important to manage potential fragmented recalls
	Establishment of a list of "risk" products	Publication using machine readable format to feed automatically information systems for producers and consumers (My fridge is now an information system and can alert me based on its content)
	Food safety education	Targeted hygiene education linked to my purchased products (either from producers or from automatic recognition of product stored in home storage)
Failure to provide appropriate food safety information to the consumer	Social networks and ICTs	Reports cultivation practices, advice consumer on hygiene practices (from more central knowledge bases) and build consumer to producer relationship feedback in a social network way

Regional Food: Policy options & IT challenges (2/2)

Main Prioritised Challenges	Potential policy option	IT Challenges & Solutions
Re-introduction of food waste and organic side-stream products in the food chain	Expansion of the scope of General Food Law and feed hygiene regulations to individual producers	Electronic register of small feed producer (like the Blue Number of International Trade Centre)
	Communal food waste handling or recycling centres	Localisation of facilities with information of food waste recycling capabilities
	Proactive education initiatives	Online education capacities
Temporary shortages of fresh produce and food poverty in a self-sufficient food system	Emergency mechanisms for food re-distribution	Supply-demand alert systems shared between local producers and neighbouring regions ones

Pharma Food: prioritised challenges

Main Prioritised Challenges
Potential drawbacks of personalised nutrition and "phoods"
Ability to perform official food-related controls
Suitability of the current EU risk assessment procedures for new food ingredients, food products and food-related technologies (incl. suitability of exposure data and maximum residue levels)

Pharma Food: policy options & IT challenges

Main Prioritised Challenges	Potential policy option	IT Challenges & Solutions
Potential drawbacks of personalised nutrition and "phoods"	Adapting or creating an effective regulatory framework	Secured mandatory digital tracking and tracing of ingredients and their combination stored by trusted third parties (machine auditable by the control authorities in case of issues)
	Redefining health and nutrition claims	Expansion of the existing health and nutrition platform
Ability to perform official food-related controls	Regulating "phood" manufacture: "Phood licence"	Online training and licencing
	Post-market monitoring and "nutrivigilance" controls	Nutrivigilance database open to public to report issues and consult existing adverse effects
	Expand third country controls	Traceability from ingredient fabric to fork potentially linked with the nutrivigilance database
Suitability of the current EU risk assessment procedures for new food ingredients, food products and food-related technologies (incl. suitability of exposure data and maximum residue levels)	Dealing with cumulative effects and long term exposure	Personal monitoring of ingredients purchased and absorbed linking automatically to knowledge base and 'nutrivigilance' systems to trigger alerts and warnings. Link with personal electronic medical file possible.

Conclusions

-The legislative framework governing food safety in the EU is robust, effective and efficient

-Action needed for improving the effectiveness of EU nutrition policies

-Harmonisation of risk assessment approaches to allow for the inclusion of other legitimate factors such as health benefits and socio-economic consequences

-A suitable and harmonised metric for benchmarking and monitoring food safety performance in the EU needs to be established

-An effective early warning system for emerging hazards at EU level is missing

-Adaptation of official control and inspection services to future needs

Investment in providing food safety and nutrition education to the public

Conclusions at IT level

-No need for breakthrough technologies: all the building blocks to allow the scenario described are existing

-Capacity of the IT business and ecosystem to create adapted solutions and new business models is real

-Legal base to enable/authorise these systems to work need to be elaborated, created and adopted

-Further effort to harmonise and standardise data structure and process in the food domain are needed even if in good tracks (UN/CEFACT)

Full study can be found here.

Thank you for your attention!