

The sustainable agriculture approach face to the new paradigms of the food chains

**Environment, Sustainable Agriculture
and Forest Management**

Padova 25-27 September 2016



2015 - UN's (SDGs) Sustainable Development Goals





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FORUM FOR THE FUTURE OF AGRICULTURE

9th Forum FFA
Where agriculture & environment meet

Bruxelles March 22, 2016

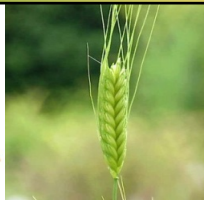
The Good Growth Plan
contributing to the UN Sustainable Development Goals

the good growth plan

- Make crops more efficient**
Increase the average productivity of the world's major crops by 20 percent without using more land, water or inputs
- Rescue more farmland**
Improve the fertility of 10 million hectares of farmland on the terms of degradation
- Help biodiversity flourish**
Enhance biodiversity on 5 million hectares of farmland
- Empower smallholders**
Reach 20 million smallholders and enable them to increase productivity by 50 percent
- Help people stay safe**
Train 20 million farm workers on labor safety, especially in developing countries
- Look after every worker**
Strive for fair labor conditions throughout our entire supply chain network

Keep up to date at www.goodgrowthplan.com

17.2 million smallholders were reached in 2015 by The Good Growth Plan





SDGs and the food chains



«We do reinvent agriculture " (José G. da Silva)

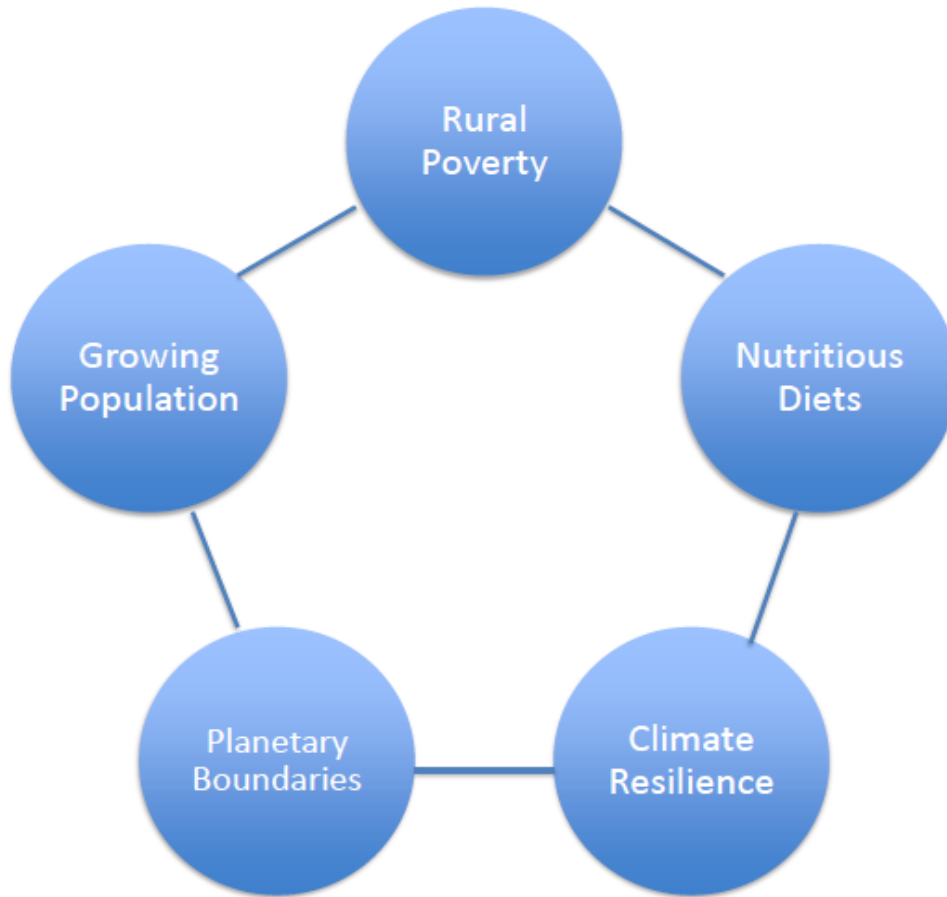


All the 7 SDGs are real also for the developed country as UE





The main challenges to reinvent agriculture



The "Pentagon"

sec. Earth Institute

Columbia University, 2016

From a vertical approach to a holistic approach





The Strategic Research and Innovation Agenda



Look forward to 2030

Food for Tomorrow's Consumer



Step-changing the innovation power and impact of the European food industry for the benefit of a sustainable society

Strategic Research and Innovation Agenda of the European Technology Platform Food for Life



The Strategic Research and and Innovation Agenda



State of the play of UE food sector

Strength:

- High regional and pan European cultural diversity
- Framework for faster creativity and innovation
- High quality science and technology ecosystems
- Advanced and effective regulations for food safety and quality



**European food sector competitive and its products very desirable
around the world**





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State of the play of UE food sector

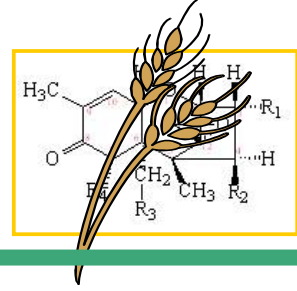
Weakness:

- Substantial and increasing lack of consumer trust
- Sector increasingly thought to create products that not promote health (negative social-media opinions)
- Diffuse perception of an increasing impact of the crop practices
- Reinforcement of for agro-ecological measure and regulation



Poor competitiveness of the agriculture sector





Cereals: an hostile food

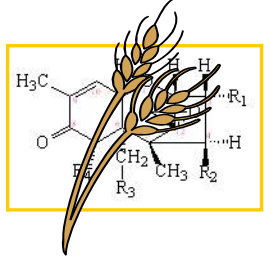
From web (extrude hard tack)

- ✓ Bio
- ✓ Vegan
- ✓ A basso contenuto di grassi
- ✓ Senza Glutine
- ✓ Senza Soia
- ✓ Senza Sesamo
- ✓ Senza Frutta a guscio
- ✓ Senza latte
- ✓ Senza uova
- ✓ Senza arachidi
- ✓ Senza Olio di palma
- ✓ Senza Solfiti
- ✓ Senza Sale aggiunto

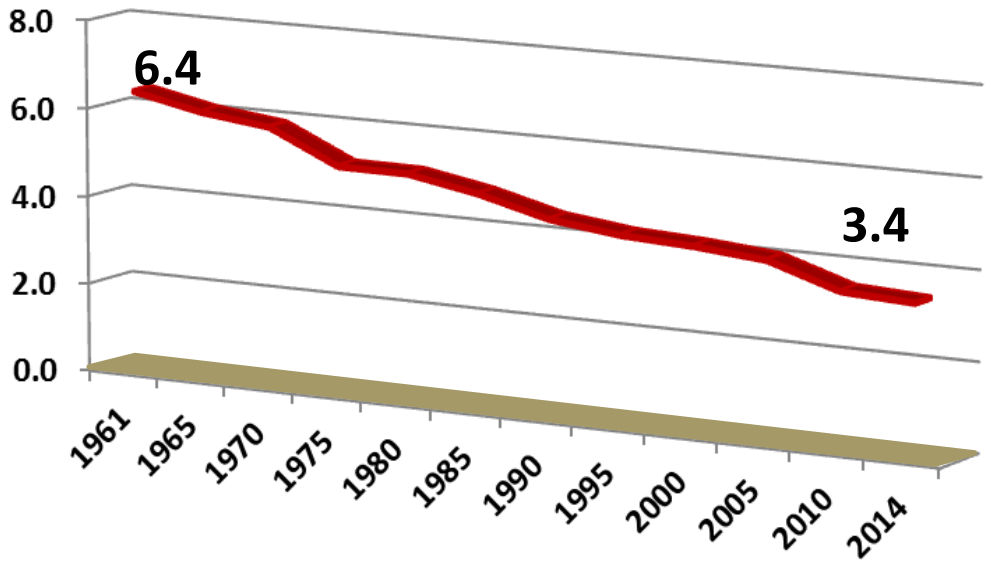


At cultural level the relationship with food is reversed: the fear of excess has replace the fear of hunger (Montanari, 2006)

Italian agriculture and commodities



Evolution of cereal and other oilseed crop harvested area (mln ha)

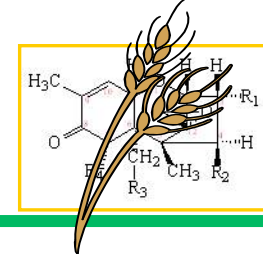


Self-supply (%)

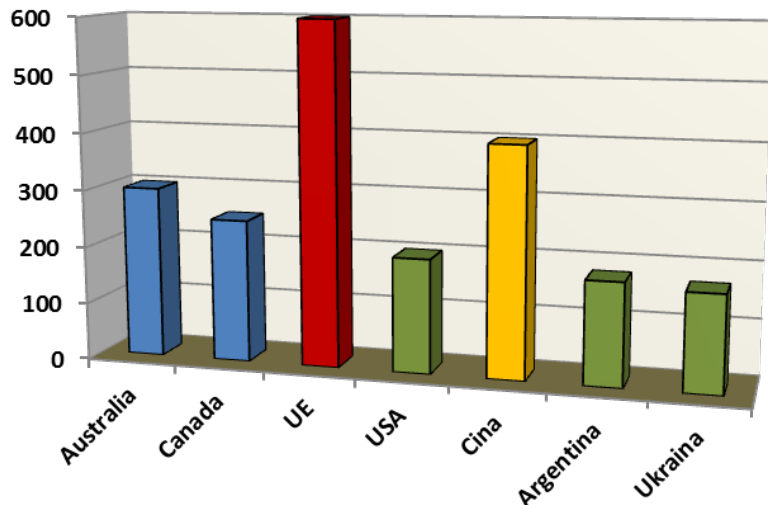
Common wheat	40	Yellow arrow pointing right
Durum wheat	70	Yellow arrow pointing down
Maize	60	Red arrow pointing down
Soybean	20	Yellow arrow pointing right
Rice	> 100	Green arrow pointing right



Structural constrains of Italian agriculture

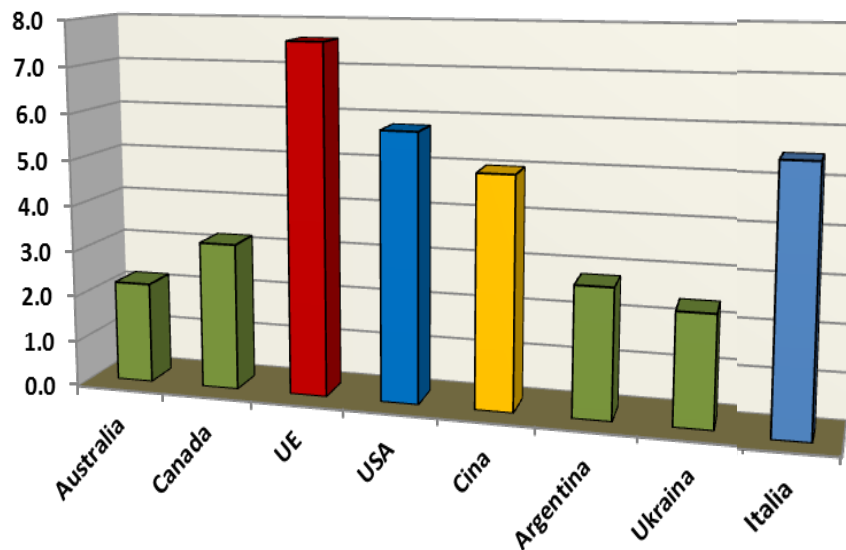


Coltural Cost (\$/ha)
(Thun Institute, 2015)



Cereal farm
Average area (ha): 12-16
Farm (n.): 250.000

Yield (t/ha)
(FAO, 2016)
















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Implementation Action Plan to 2030 (Draft: June 2016)

R&I Target 1		Engagement and involvement of Consumers	
2018-2019	Action 1	Improving insights in Consumers <i>Impact:</i> improved consumer engagement and insight; new products aligned with consumer and societal needs.	  
	Action 2	Better bi-directional communication <i>Impact:</i> better bi-directional communication between consumers and food chain actors; new products and new business opportunities.	  
	Action 3	New food production and delivery <i>Impact:</i> clear understanding of consumer perceptions and behaviour impacts; novel sustainable business models.	 
2019-2020	Action 4	Footprinting of Food: Consumer Engagement in Sustainability <i>Impact:</i> increased sustainability of the food chain; improved consumer engagement; generation of functional open source systems.	 
	Action 5	The Smart Food Grid: Modular Food Production and Distribution <i>Impact:</i> novel distribution channels and delivery modes; increased sustainability of the food chain.	



Research and knowledge



Networking














New Products and business opportunity



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R&I Target 2		Basis for a more personalized and customized food supply	
2018-2019	Action 1	<p>The Food I Love: Appreciation of Diversity in Food and Eating</p> <p><i>Impact:</i> understanding and recognition of food appreciation across the EU and its relation to consumption practices; new products and services responding to consumer diversity.</p>	  
	Action 2	Dietary for the prevention of non-communicable diseases	
	Action 3	<p>In Silico Food Design: Understanding Food Digestion</p> <p><i>Impact:</i> increased knowledge about micronutrient digestion; new ingredients targeted to better address malnutrition; minimise the need for animal testing.</p>	 
2019-2020	Action 4	Microbiome and gut ecosystem	
	Action 5	<p>Packaging 4.0: Intelligent and Communicating Packages</p> <p><i>Impact:</i> novel intelligent packaging solutions; increased sustainability and operability of the food systems.</p>	  
2019-2020	Action 6	New concepts and technologies for health and wellbeing	
		<p><i>Impact:</i> improved methodologies to characterize nutritional attributes at different stages and the impact of new processing techniques on them; consumer acceptance of new and alternative food sources; understanding of the effects of large-scale changes in the supply chain</p>	  



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R&I Target 3		More flexible and sustainable food system	
2018-2019	Action 1	Getting It Right: Integrated Food Safety as a Unique Selling Point <i>Impact:</i> less foodborne disease incidences and better forecasting models; decrease in food waste; novel "milder"	  
	Action 2	Bio-availability and enhanced health active substance <i>Impact:</i> optimized bio-availability and enhanced health active substances; new food options with lower caloric intake; increased export of food products and technologies.	 
	Action 3	Coming Full Circle: Towards Sustainable Packaging Systems <i>Impact:</i> Reduced the environmental impact of packaging; improved the environmental performance of the food system.	  
	Action 4	Alternative food sources dependency on raw material imports; new business opportunities.	 
2019-2020	Action 5	Next generation strategy for food safety prediction the toxicity of new components; minimise the need for animal testing.	
	Action 6	More natural and less refined ingredients of primary producers in the food production chain; empowerment of rural areas; increased consumer trust in the agro-food-industry; less environmental effects of food production; new business opportunities.	  

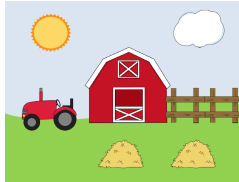


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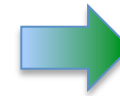


How to match the sustainable agriculture approach to these new paradigms of the food chains ?

The case of the cereals (wheat and maize) in Italy



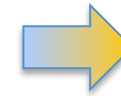
At farm scale: higher production efficiency



Economic sustainability



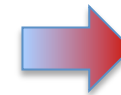
At community scale: higher food quality and safety



Social sustainability



At planetary scale: higher ecological sustainability



Ecological sustainability



The sustainable agriculture approach face to the new paradigms of the food chains



The priority strategies for the cereals farmer and elevator system

- **Production (higher yield, practice efficiency)**
- **Quality – better technological property (proteins, rheology)**
- **Safety – less contaminants (mycotoxins, pesticide residues)**

Which are the role of CAP and the UE Regulations ?





The sustainable agriculture approach face to the new paradigms of the food chains

Look forward to 2030



Negative

Neutral

Positive



		Common and durum wheat			Maize		
		Production	Tech. Quality	Safety	Production	Tech. Quality	Safety
Soil tillage	Minimum/no tillage vs ploughing	Yellow	Red	Red	Yellow	Red	Red
Nutrition	N:P limitation vs balanced distribution	Red	Red	Yellow	Yellow	Red	Red
Weed control	a.i. limitation (Dir. 128)	Yellow	Yellow	Yellow	Yellow/Red	Yellow/Red	Yellow/Red
Pest control	a.i. limitation (Dir. 128)	Yellow	Yellow	Yellow	Red	Red	Red
Disease control	a.i. limitation (Dir. 128)	Red	Red	Red	Yellow	Yellow	Yellow
Water nutrition	CAP financial support	Yellow	Yellow	Yellow	Green	Green/Yellow	Green/Yellow
Variety							Red

Farmers have now less means to face the needs of the food chain, even more in the next future.

.....1970

**Common
Wheat**

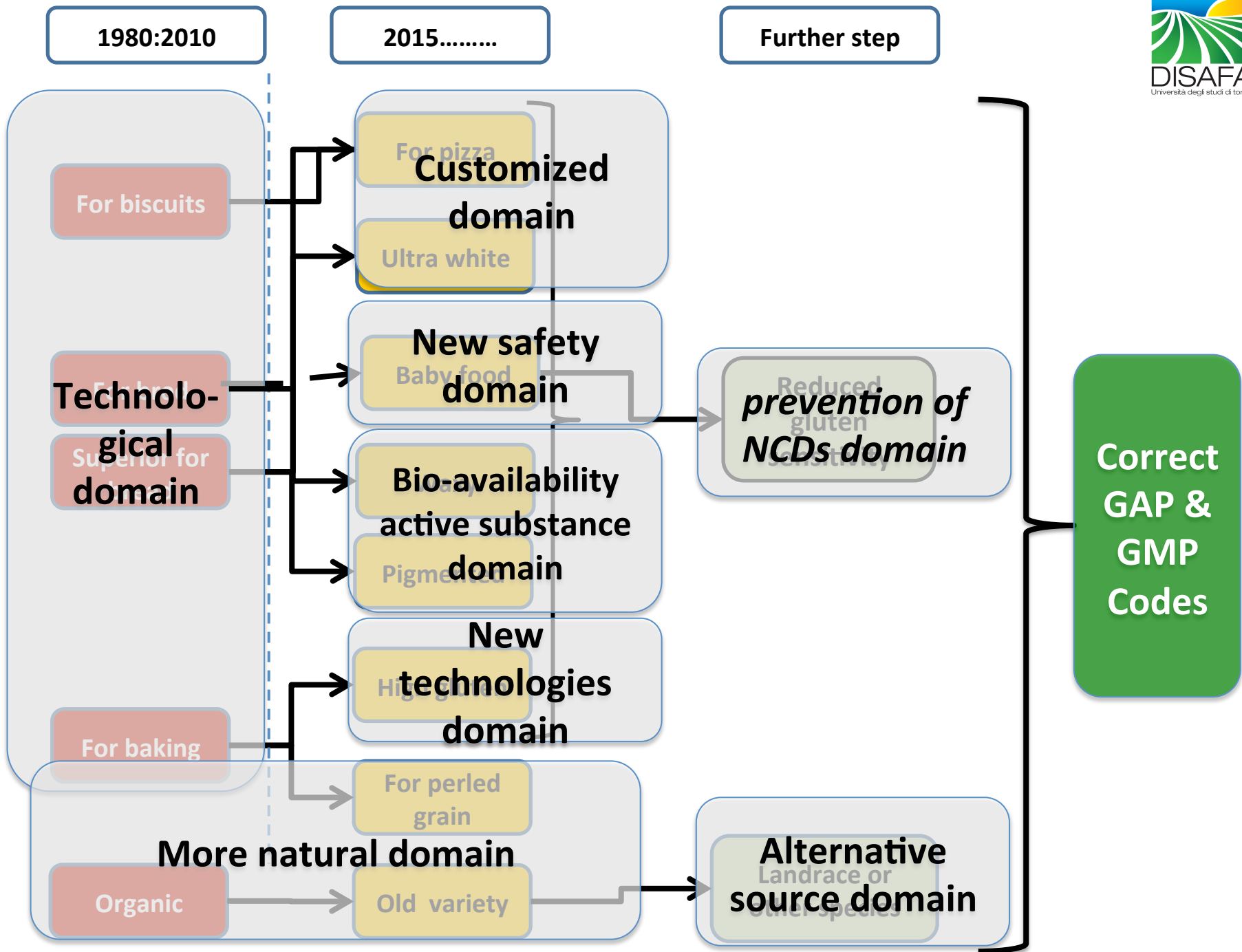
Feed

“Old” and “New” approach

From
Commodity
to Specialty

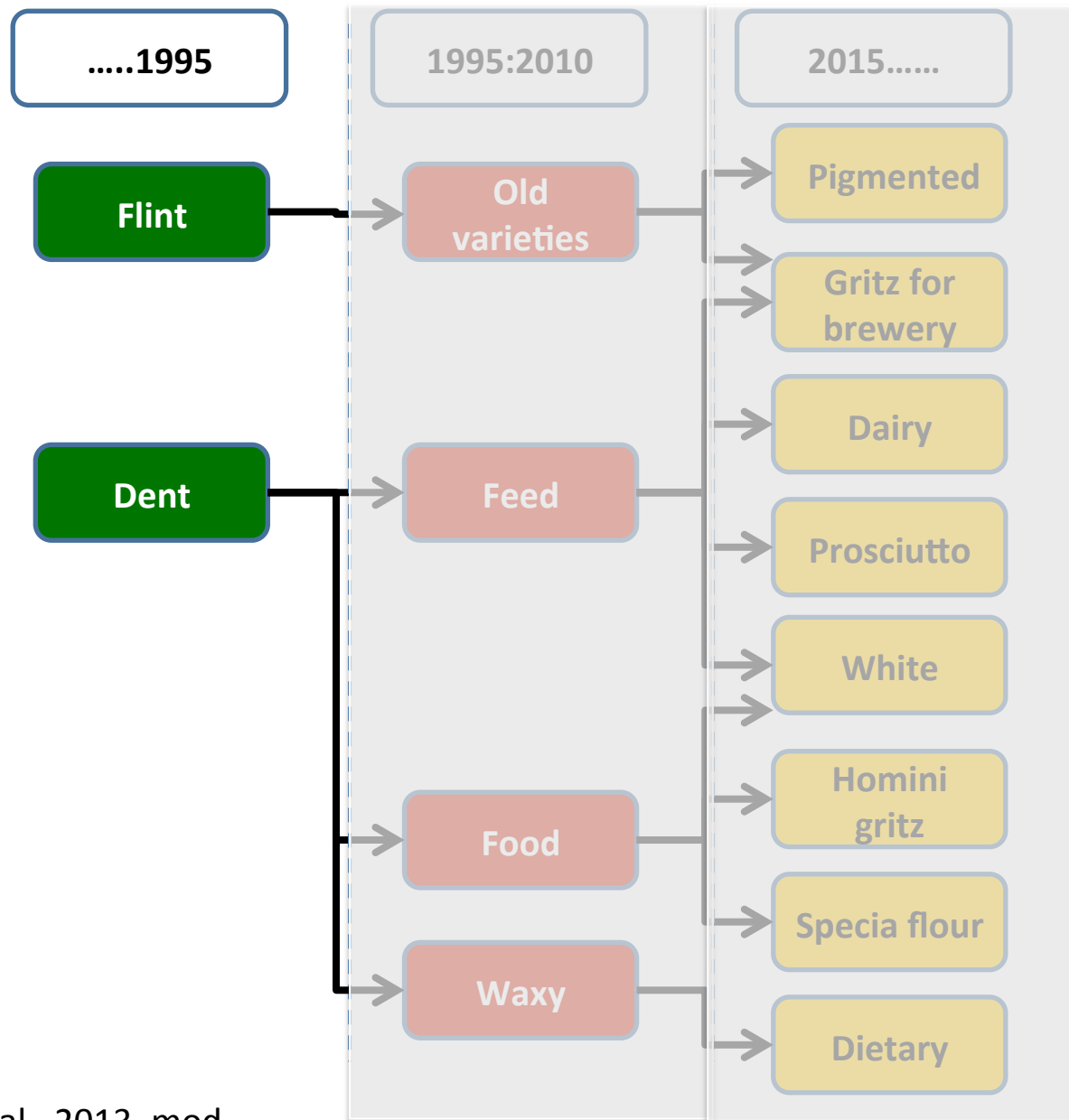
Feed

**Conversion from commodity to specialty
To better fit the
Consumer Driven Demand**



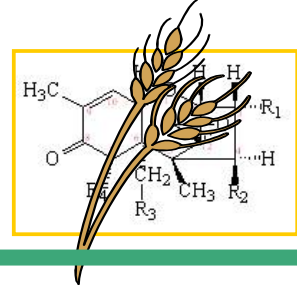
From commodity to specilaty

Maize for grain



Reyneri et al., 2013, mod.

Conclusion



Food chain more oriented toward a "Consumer-Driven Demand"

Opportunity

- Enhance farmer income e competitiveness
- New market opportunity
- Valorization of marginal situation (environment....)

Threat

- Commodity price too low to stimulate innovation and investments
- The added value is adsorbed by distribution sector
- Increasing of non rational or scientific-based behaviour
- Agriculture will even more become the maidservant of social needs



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Grazie