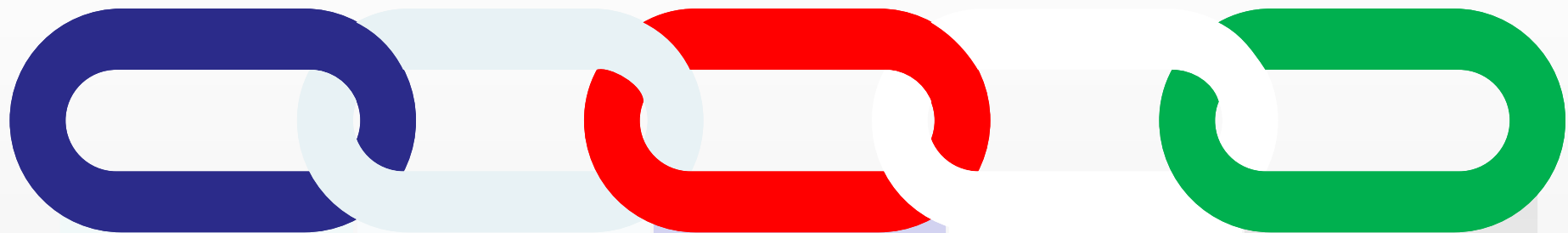


# Theme 5: Transformation in the biomaterials value chain

Professor Gerry Boyle, Director Teagasc  
Teagasc Technology Foresight 2035, Aviva  
Stadium, Dublin, 8<sup>th</sup> March, 2016

# The biomaterials value chain system



**Inputs  
sub-system**

**Farm  
production  
sub-system**

**Processing  
sub-system**

**Distribution  
and trading  
sub-system**

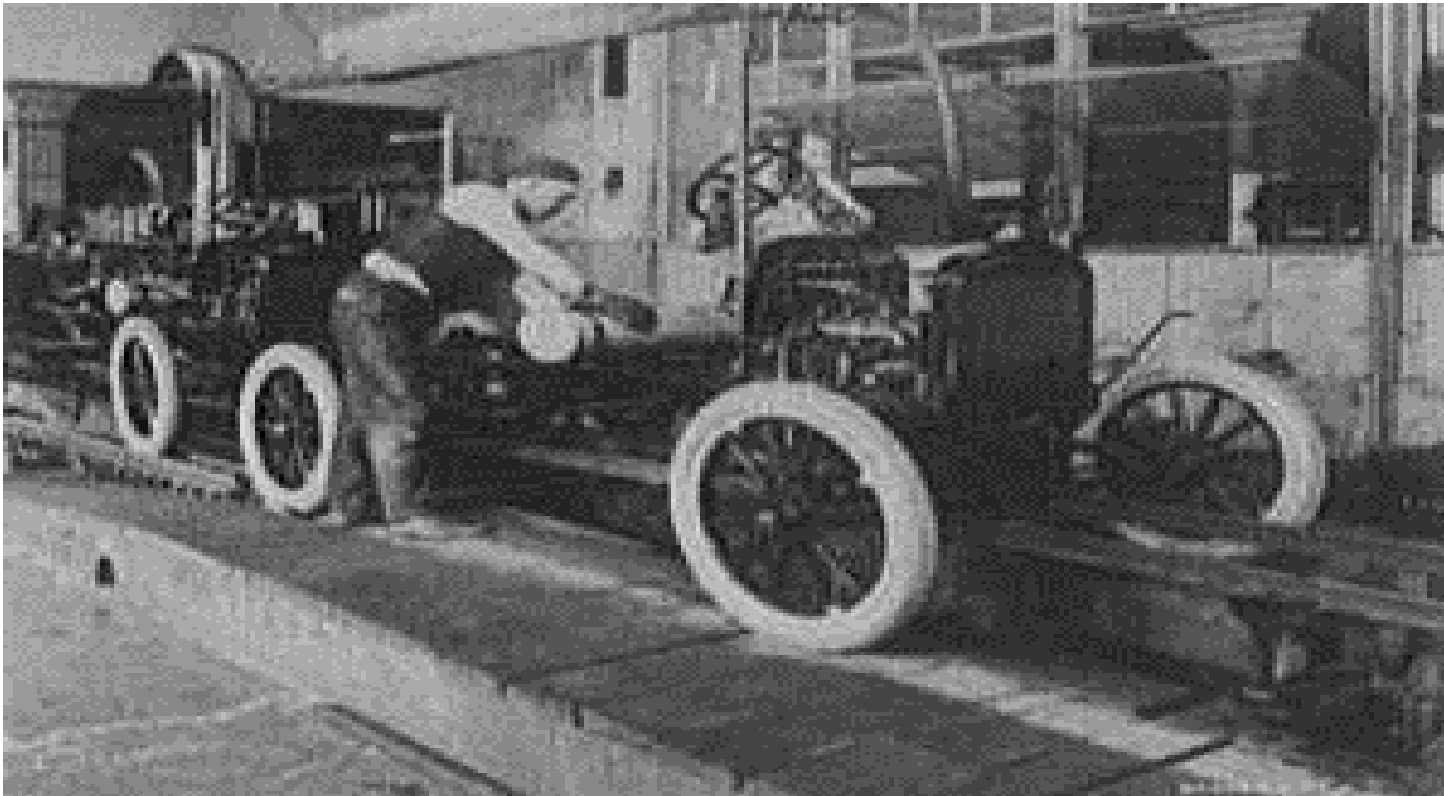
**Retail and  
consumer  
sub-system**

# Technological change

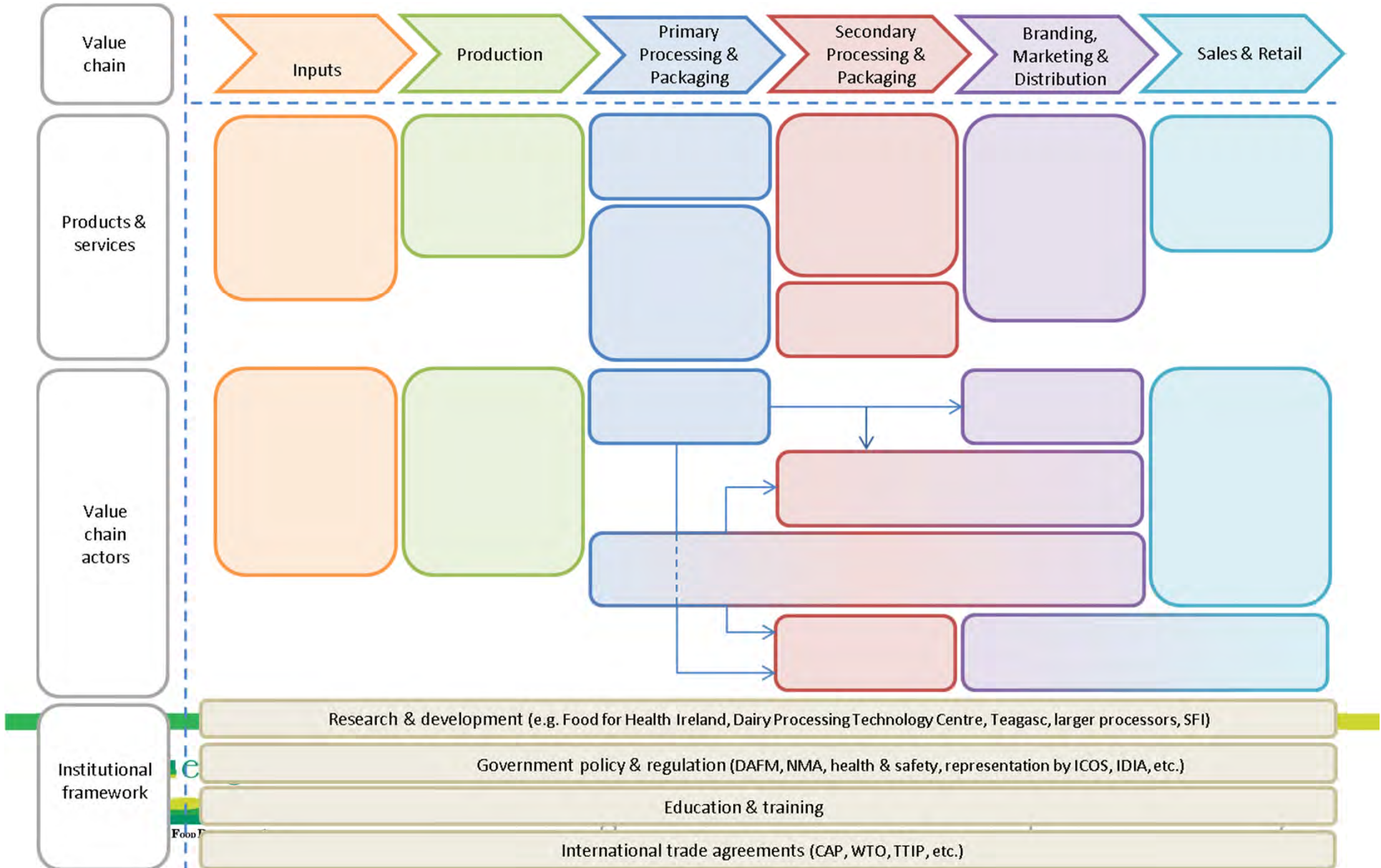
- Technological change does not just result from innovation in new processes, products or services.
- It is any change that improves productivity.
- Some of the most important changes in productivity have resulted from changes in the organisation of the production [system](#).
- Over the next 20 years we can expect organization changes to take place in each link of the food value chain and across the links. Moreover we can expect new chains to [emerge](#).

# Ford's Assembly Line

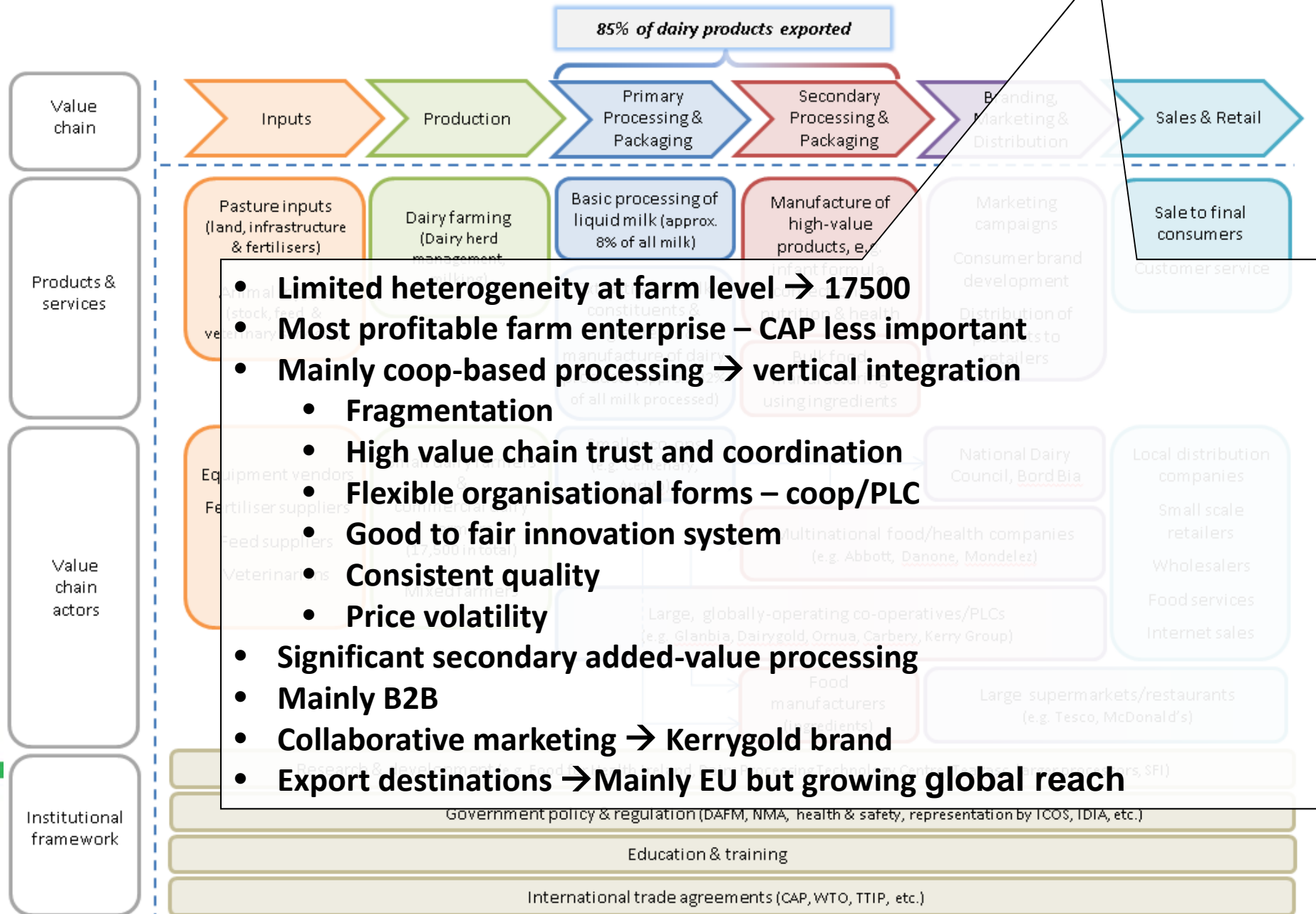
Before the assembly line, it took 14 hours to build one car. With the assembly line, workers could build one car every 93 [minutes](#).



# Generic food value chain

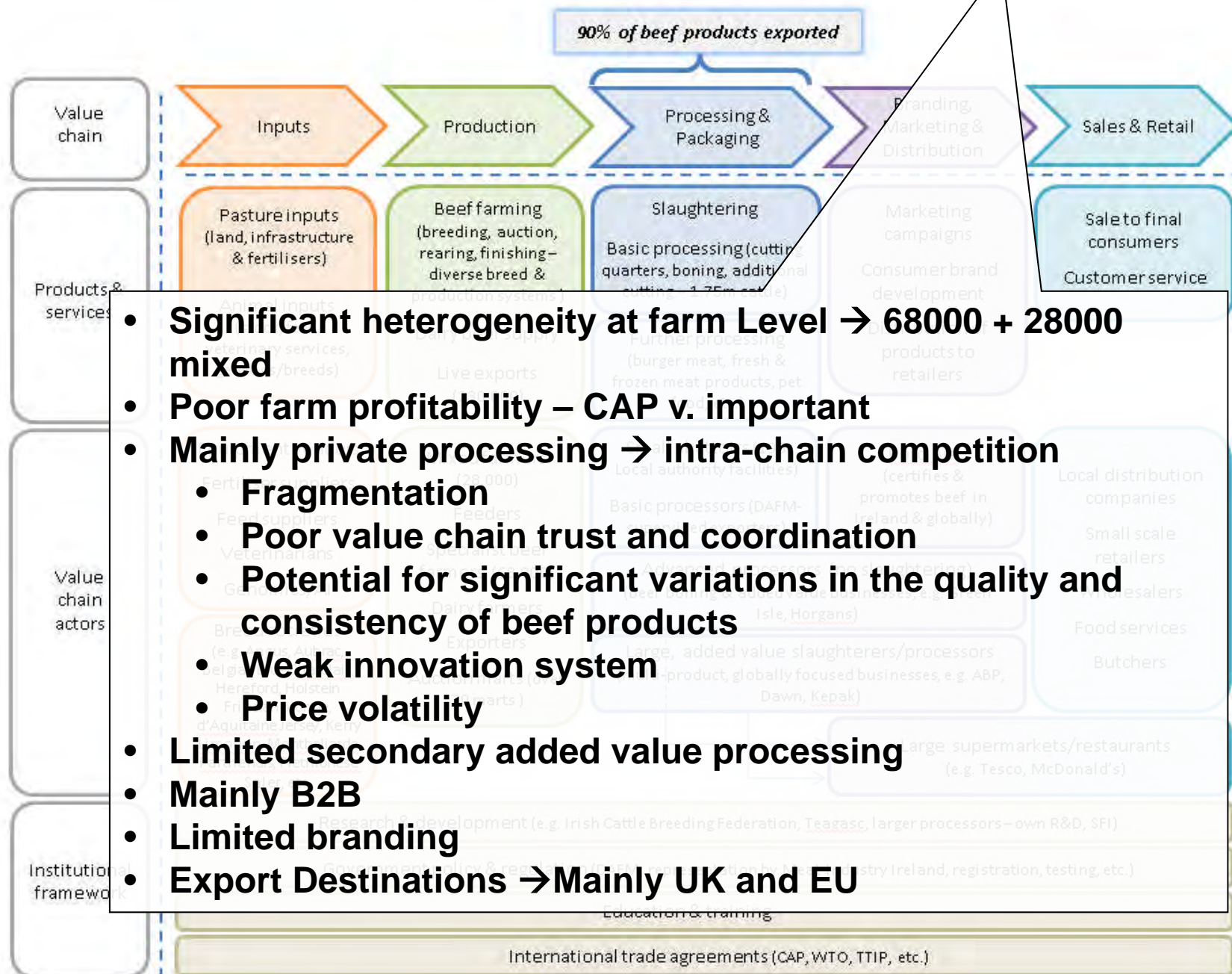


# Mapping the Irish Dairy Value Chain



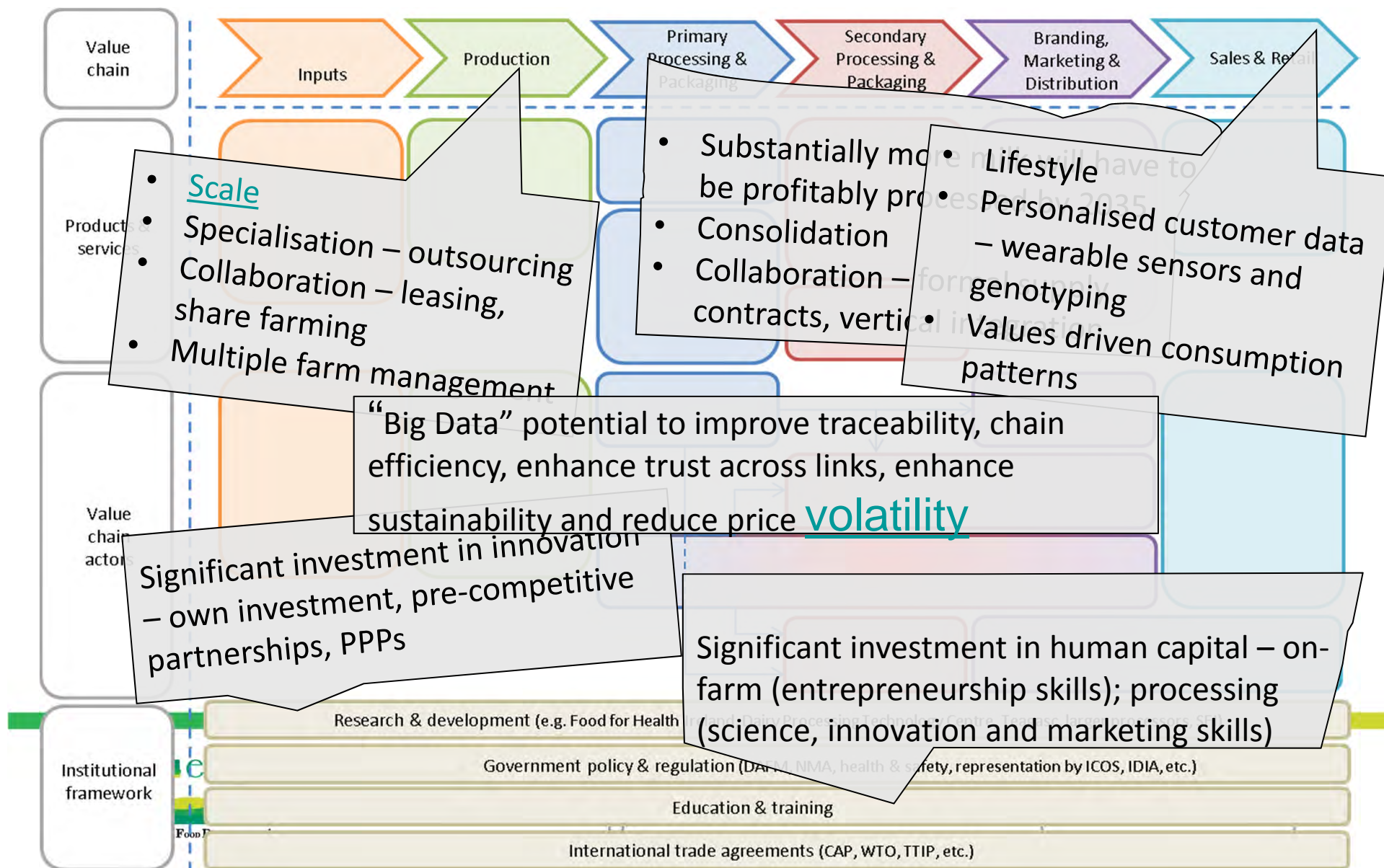
- **Limited heterogeneity at farm level → 17500**
- **Most profitable farm enterprise – CAP less important**
- **Mainly coop-based processing → vertical integration**
  - **Fragmentation**
  - **High value chain trust and coordination**
  - **Flexible organisational forms – coop/PLC**
  - **Good to fair innovation system**
  - **Consistent quality**
  - **Price volatility**
- **Significant secondary added-value processing**
- **Mainly B2B**
- **Collaborative marketing → Kerrygold brand**
- **Export destinations → Mainly EU but growing global reach**

# Mapping the Irish Beef Value Chain



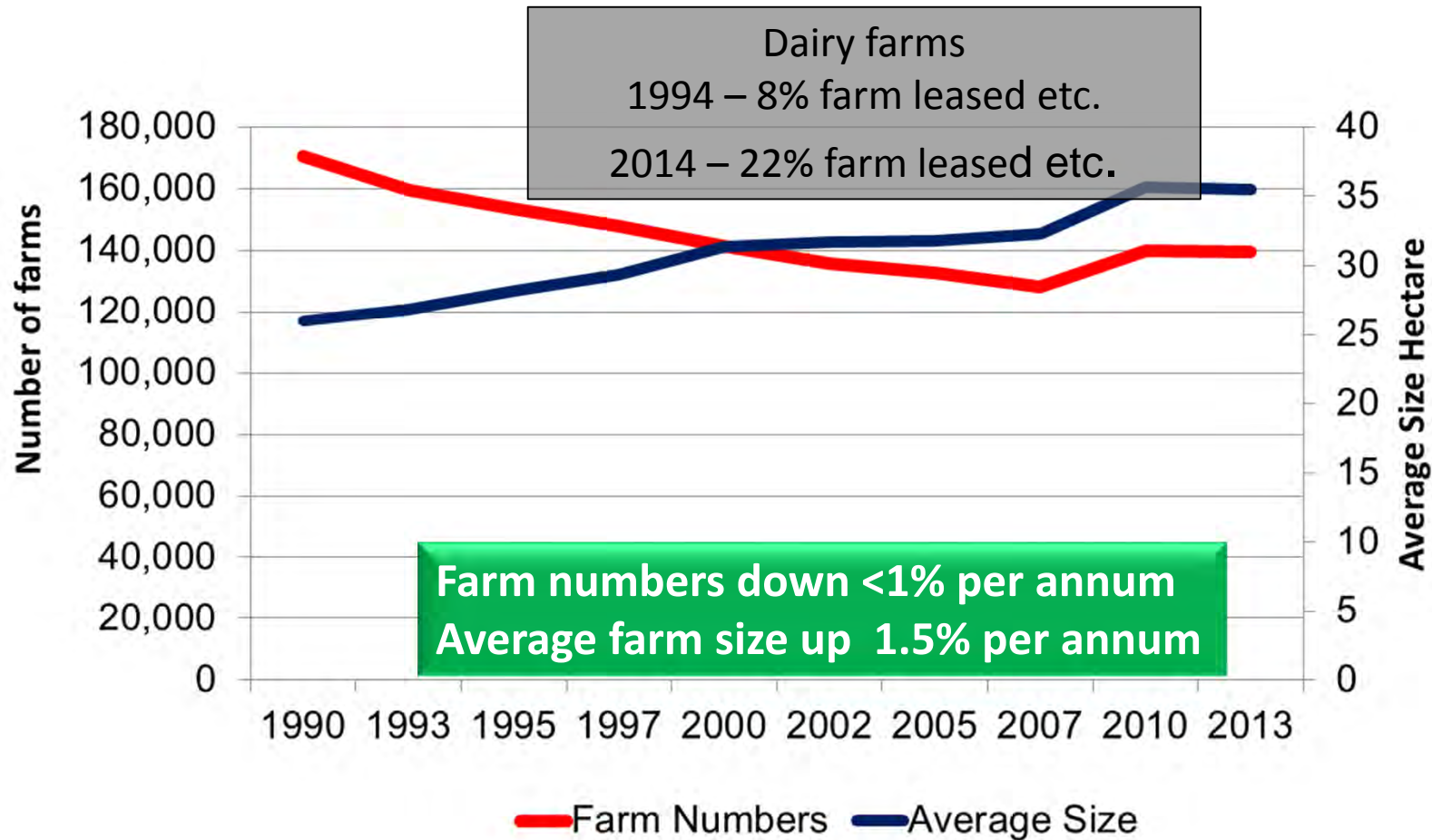
- **Significant heterogeneity at farm Level → 68000 + 28000 mixed**
- **Poor farm profitability – CAP v. important**
- **Mainly private processing → intra-chain competition**
  - **Fragmentation**
  - **Poor value chain trust and coordination**
  - **Potential for significant variations in the quality and consistency of beef products**
- **Weak innovation system**
- **Price volatility**
- **Limited secondary added value processing**
- **Mainly B2B**
- **Limited branding**
- **Export Destinations → Mainly UK and EU**

# Transformations in the food value chain

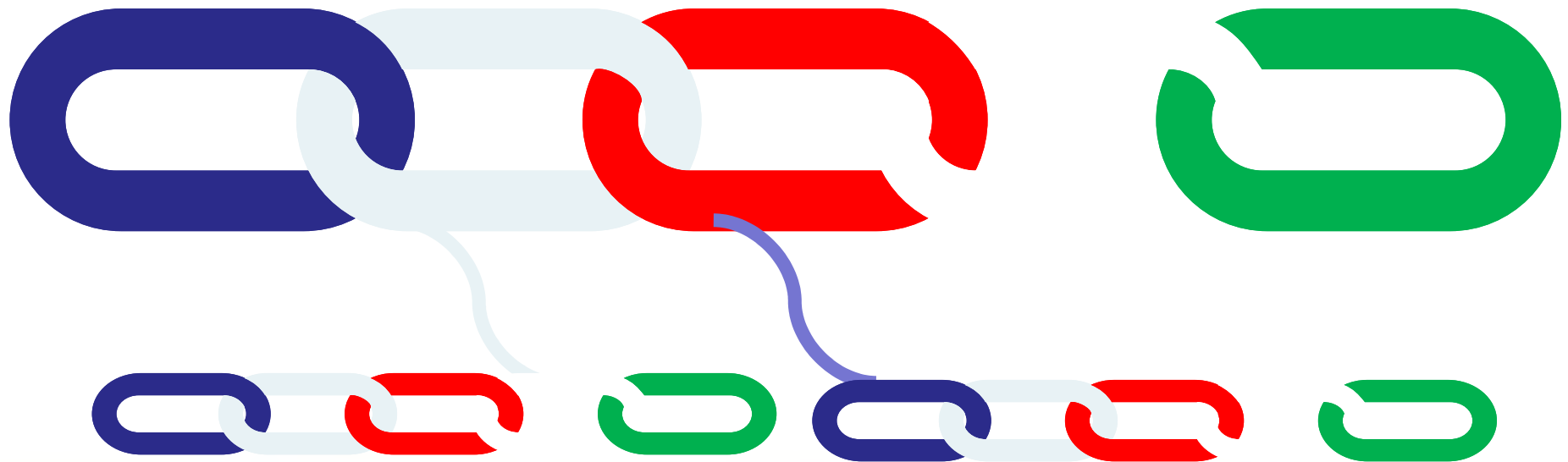
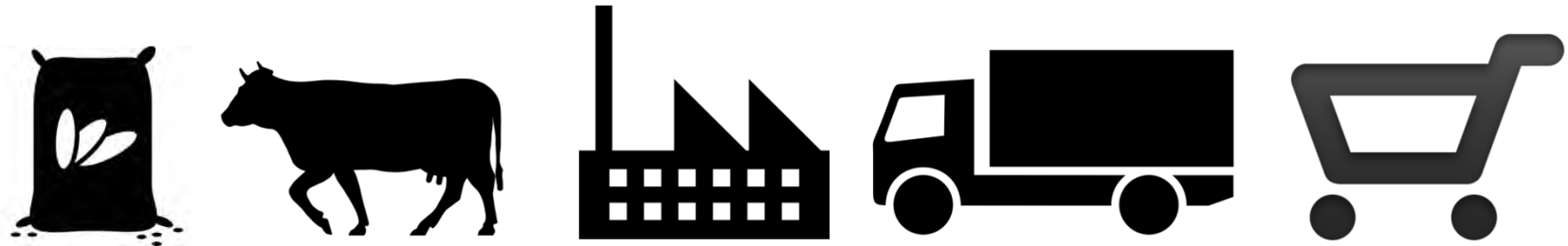




# Farm Numbers – change slow to occur



# Potential new value chains



- Genetic differentiation of raw materials to produce higher value products

- Extraction of high-value trace chemicals from raw materials, e.g. milk
- Biorefining of biomass, including waste

# Thank you