

The future of (NZ) food & agri:
'More with Less' & 'More Added Value'

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The Netherlands

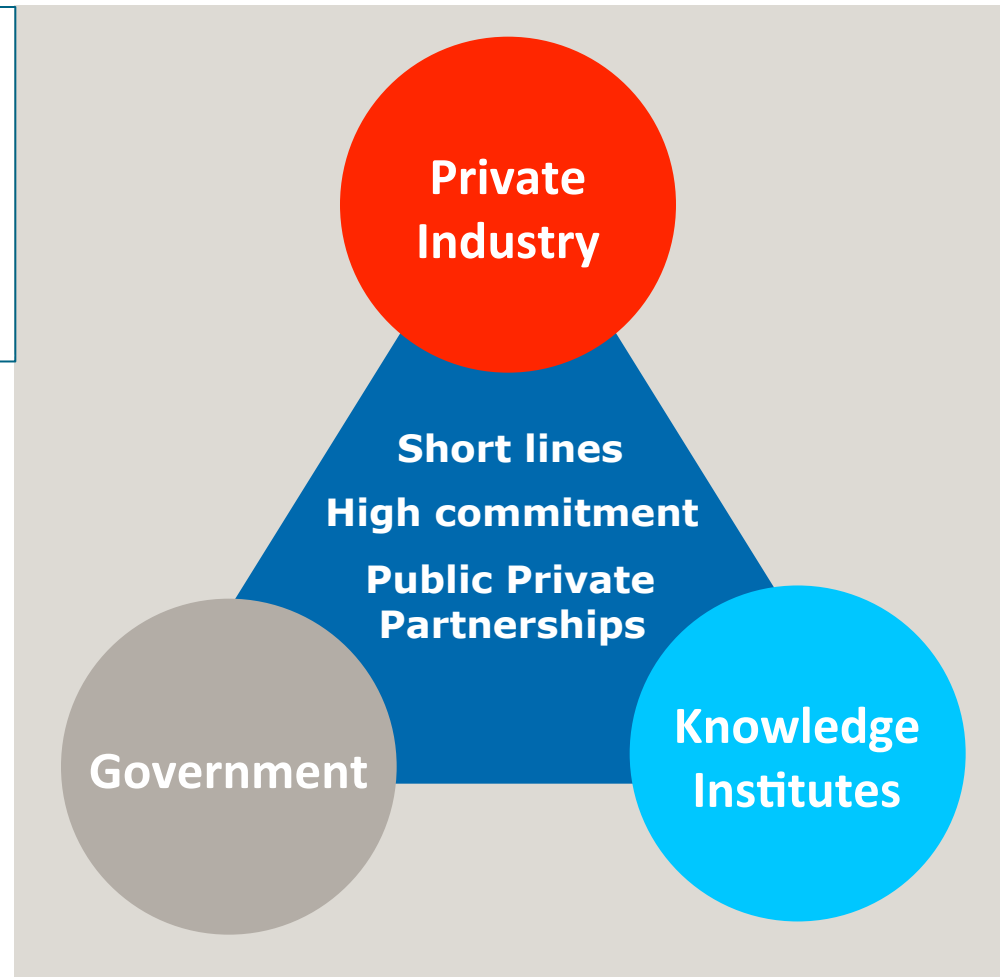
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The Netherlands

- Small country (1/7 of NZ), densely populated (17 m people)
- 2nd largest exporter of food in the world
- Major sectors: horticult. (*greenh.*) & livestock (dairy, pigs, poultry)
- Characteristics: *highly productive, very efficient, knowledge-intensive*
- Top-class farmers: *added value per ha 5x European average*
- Strong agribusiness: *4 companies in world top-40*
- Leading in science: *Wageningen UR the #1 worldwide in food & agri*
- Low footprint (land, resources, GHG emissions) per kg of product



Golden triangle: *the* key behind the Dutch success



**Agri&Food (important) part of
the Dutch Topsector policy**

Dutch Topsector Policy

- Industry policy since 2010, with industry setting priorities for major part of government funding on (applied) research
- Aim: to increase growth and improve competitiveness
- Industry in the lead with President Top Team in role of CEO
- Top Team: business, government, science ('golden triangle')
- Increasingly successful, as Topsectors:
 - grow 2x faster than rest of the economy
 - spend much more on R&D than the rest
 - have increased participation of SME

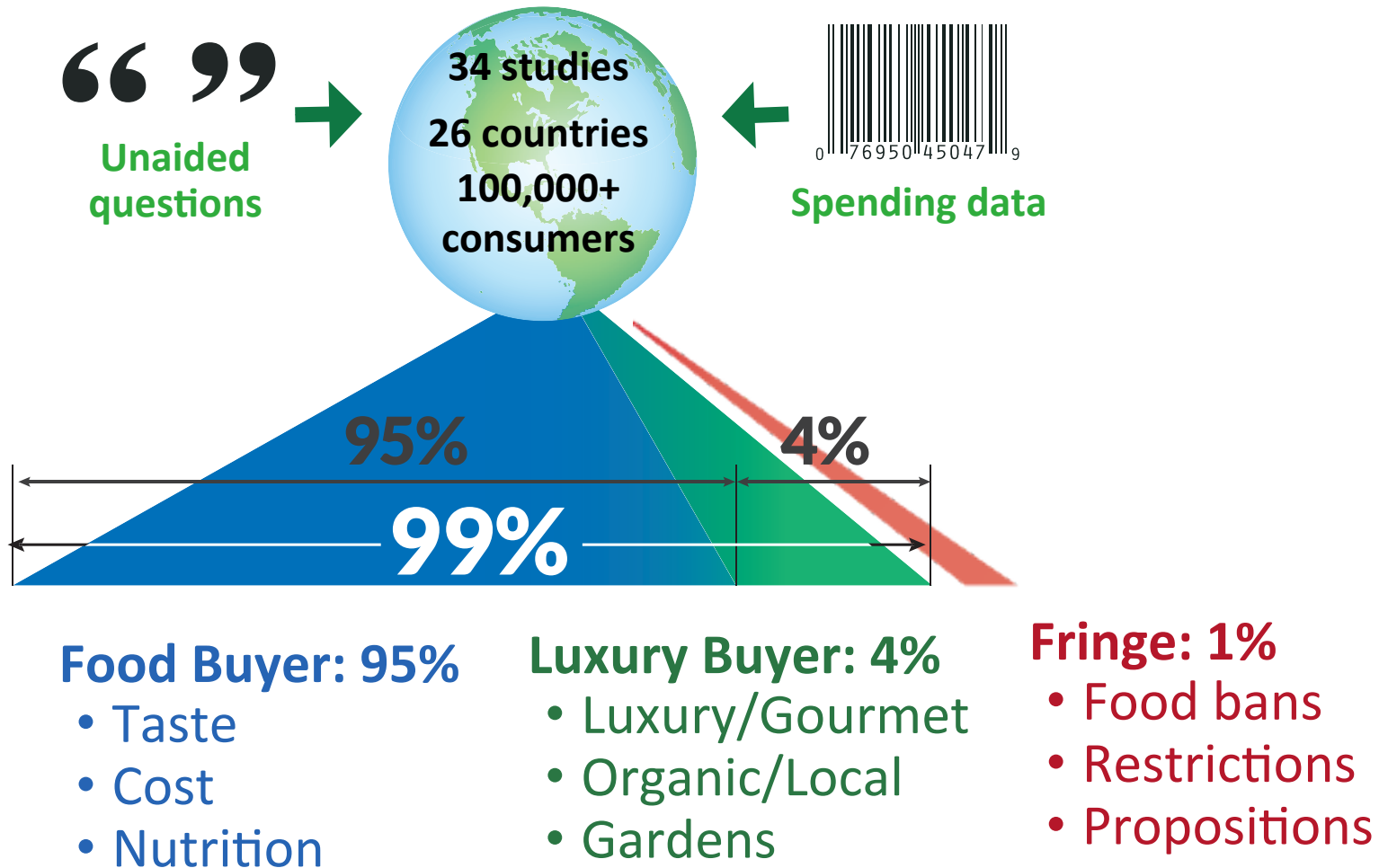


A Call to Arms ('NZ Agri-Food Strategy')

- Selectively and profitably increase quantities and sales of current range of products
- Profitably produce and market new innovative, high-value products
- Develop value chains that enhance integrity and safety of the food
- Become world leaders in sustainability



2013 International Consumer Attitudes Study



The world will change considerably

- Namely:
 - A strong increase in population (plus 2 to 3 bn)
 - Further increase in wealth (+ 3 bn in middle class)
- Which means:
 - An enormous increase in the demand for food
 - A doubling in the demand for high-quality protein (vegetables, dairy, meat)

The next
40 years
the same
amount of
food has
to be
produced
as during
the past
8,000
years!!



High productivity & efficiency is key because:

- Lowest input and emissions per kg of product (LCAs)
.. regular production systems much better than organic ones
- Less land needed, more left for other use (people, nature)
- Difference with vegetarian diets much smaller than anticipated

CO₂-eq. emissions per kg of product



Pork 4.5



Poultry 2.6



Cashew nuts 2.3



Tofu 2.0

Plus 1%-point productivity in EU crop production

- Feeds more than 10 m people per annum
- Increases people's welfare in the EU by € 500 m
- Reduces EU's net virtual land imports by 1.2 m hectares
- Saves 220 m tons of CO2 emissions (\approx France!)
- Preserves global biodiversity equal to flora and fauna of 600,000 hectares of rainforest

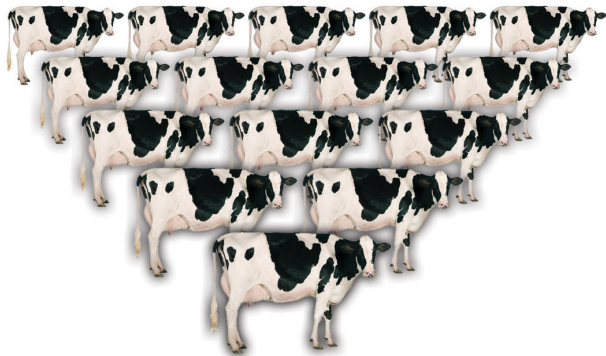
Noleppa et al (2013), Humboldt University



When using innovation / new technologies in dairy

... we can meet the growing demand,
freeze the footprint and save 66 m (of current) cows

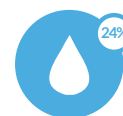
66 m out of
330 m cows
= 20% fewer



747 m tons
of feed and
155 m HAs
of farmland –
the size of Alaska



165 bn liters
of water – the
annual use of
Germany, France
and the UK



A 9,000-kg cow uses ca **1/3 less energy** per
kg of milk than two 4,500-kg cows and
produces ca **1/3 lower GHG emissions**

Hightech greenhouse horticulture: 15x (!) more productive per m³ of water

Open Field



3 kg



Plastic greenhouse



13 kg



High-tech greenhouse



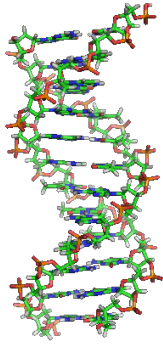
43 kg



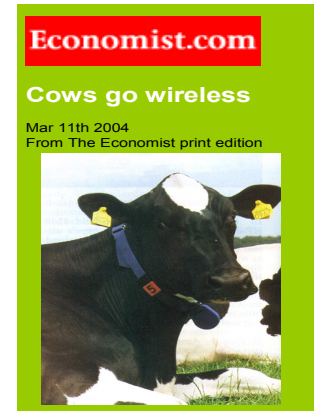
Increasing control of production factors

Promising areas for future research / investments

- Develop and exploit genomics ('which genes do what')
 - breeding: faster selection of next generation, incl. 'soft traits'
 - tailor-made management of crops and (individual) animals
 - personalized nutrition for consumers ('nutrition & health')



- Include smart IT-technologies (sensors, robotics)
 - more precise feeding, use of fertilizer, water management
 - earlier detection of disease in crops and animals
 - more efficient food processing
 - intelligent cooling, transport, storage



- Bio-refinery
 - re-use of waste and by-products
 - realizing the circular economy



Options for NZ dairy to adjust

- Refine / improve the farming system (10-15%?) – *always good*
- Reduce production intensity (destock, less input) – *at a high cost*
- Adjust the farming system – *housing, prod./cow up, year-round*
 - safeguards the environment and assures good animal welfare
 - offers opportunity to capture future economic growth (and income)
 - no reason to loose image now when done in a balanced way
 - good for image in 10+ years: helps to meet the growing demand for dairy



To conclude

- Food & Agri is a tremendous growth area, also for NZ.
== Is NZ intended to be part of that growth? ==
- New technologies to bring unprecedented opportunities
- Close collaboration between business, government and science
(*'golden triangle'*) key to success
- Joining forces internationally crucial. *Riddet excellent example!*

