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DEEResearch

Presentation Eva

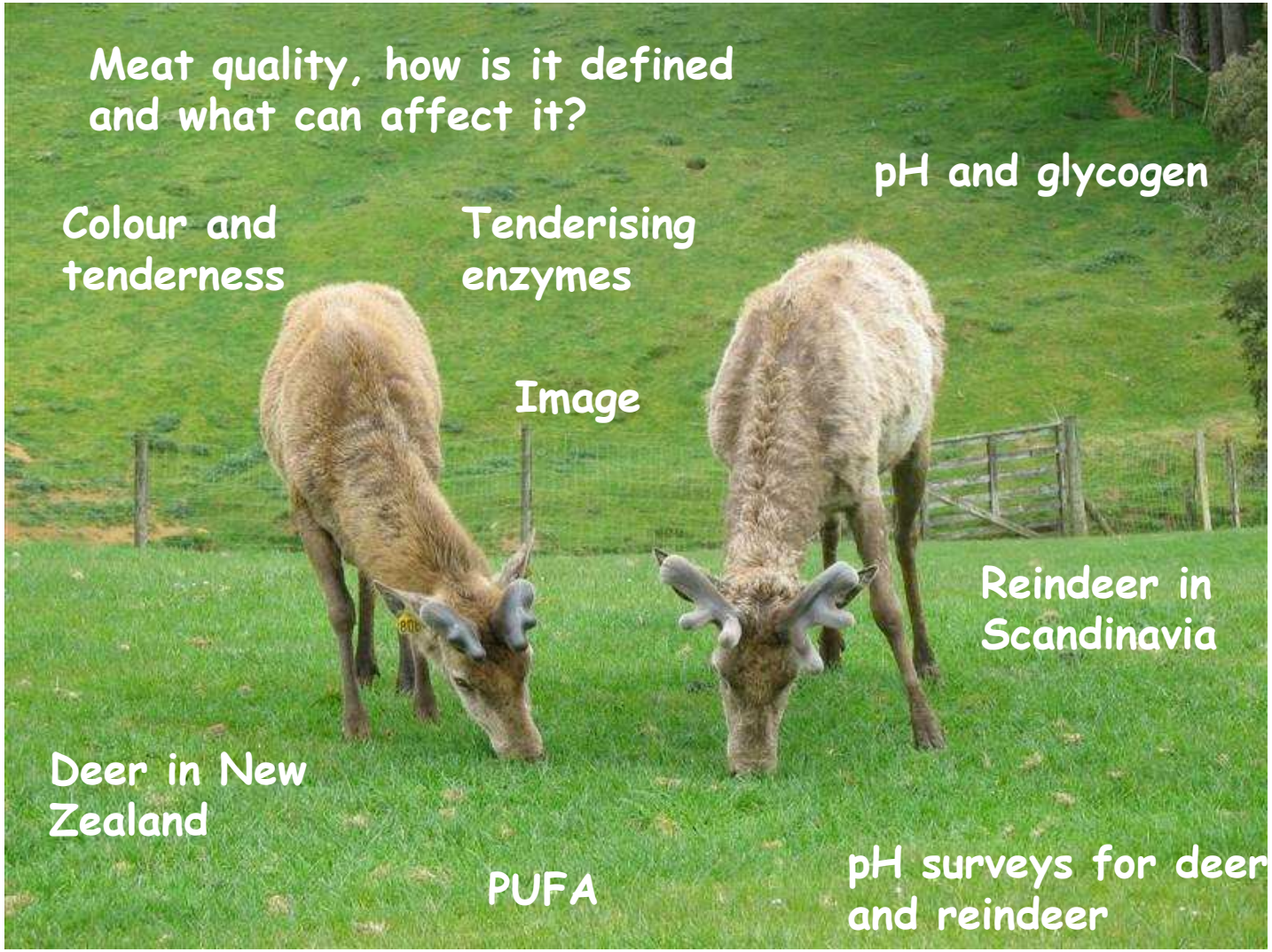
Basic degrees (MSc, PhD) from Swedish University of Agricultural Sciences in Animal Science, Food Science/Meat Science

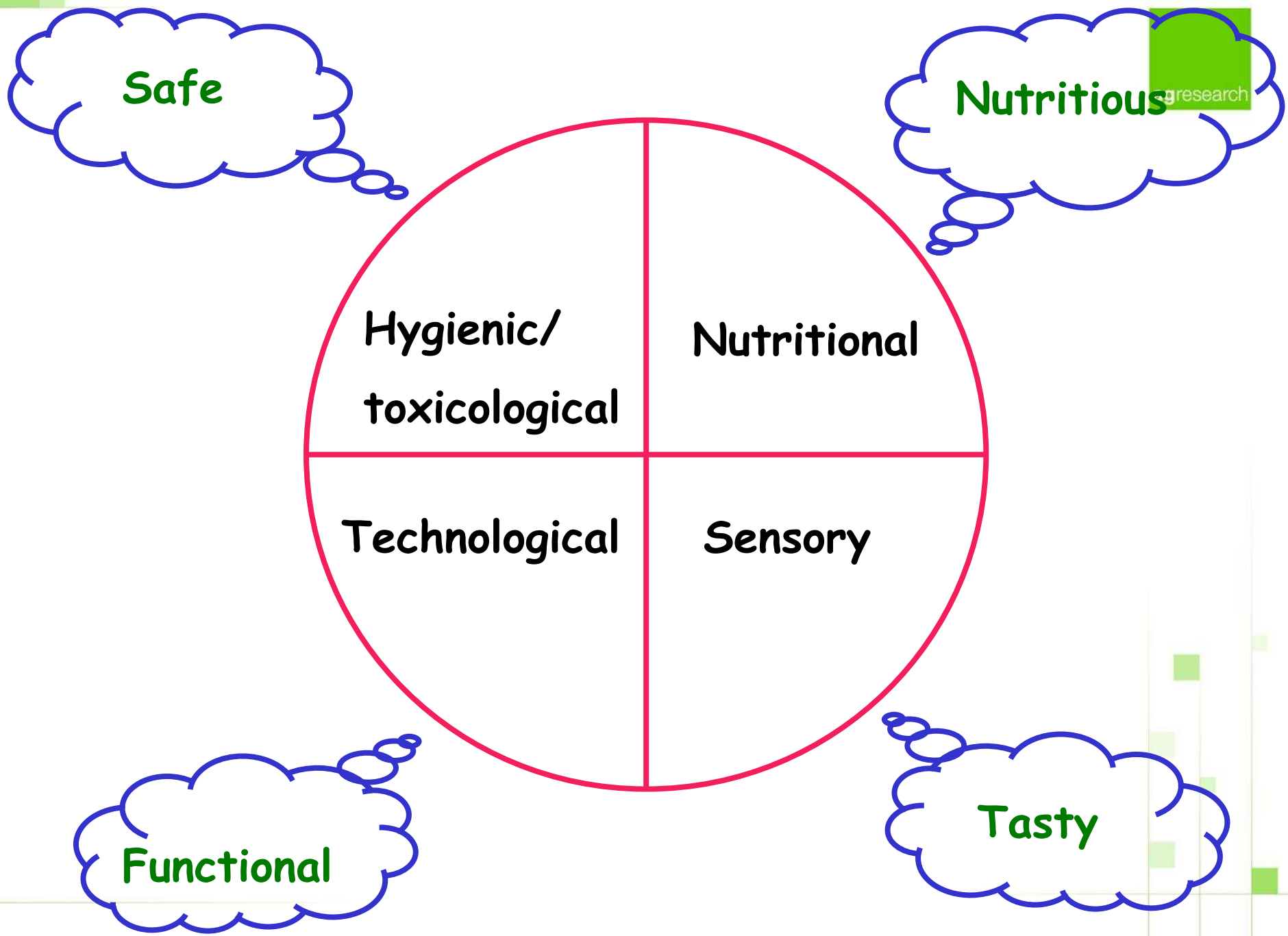
Extensive experience (20 years) of deer and reindeer meat production systems in Scandinavia, New Zealand, Alaska and Australia

<u>Present positions:</u>
Senior Meat Scientist, AgResearch, New Zealand

Affiliate Associate Professor (Animal Science) University of Alaska Fairbanks, USA

Presentation outline

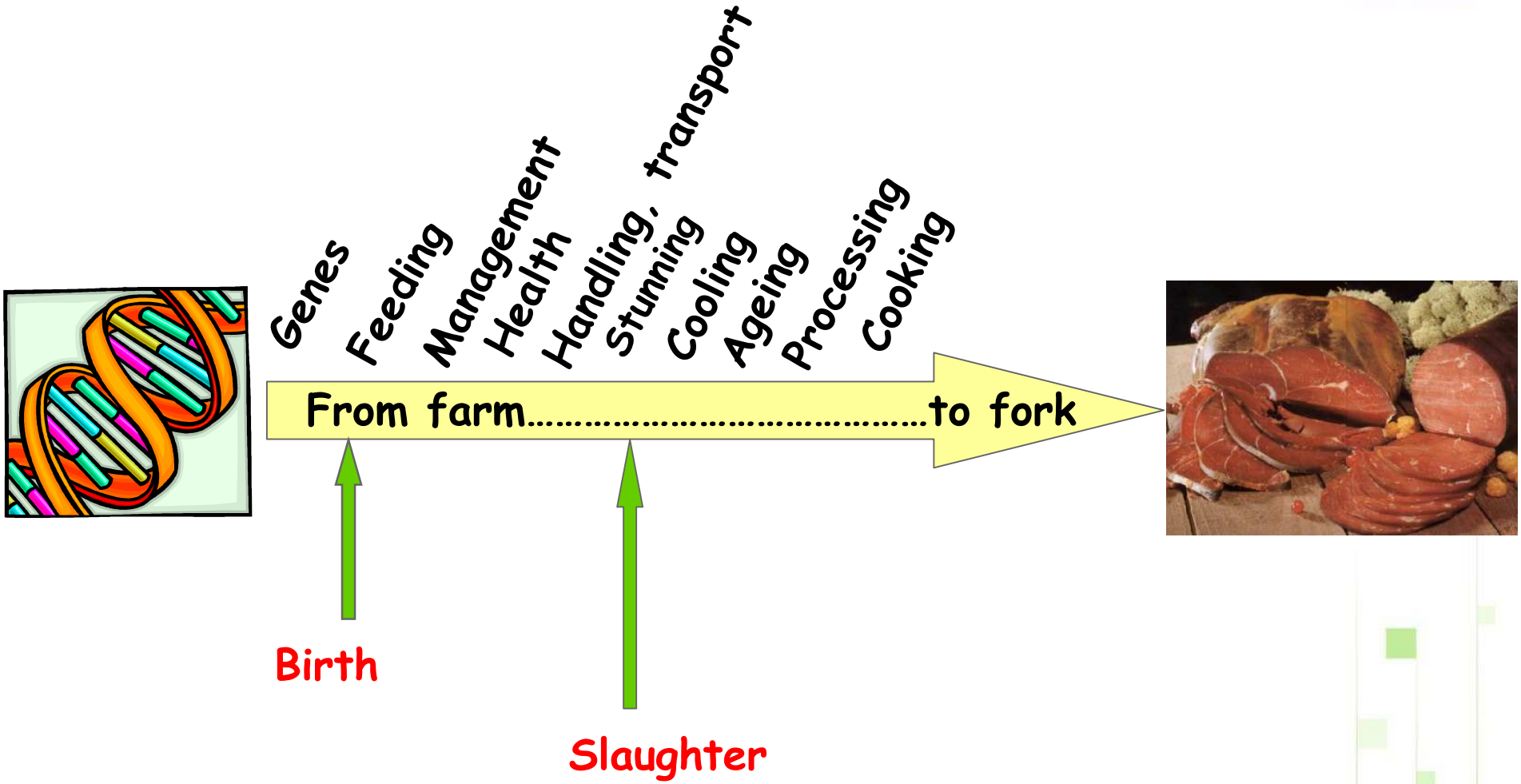



Safe
Nutritious
Hygienic/
toxicological
Nutritional
Technological
Sensory
Functional
Tasty

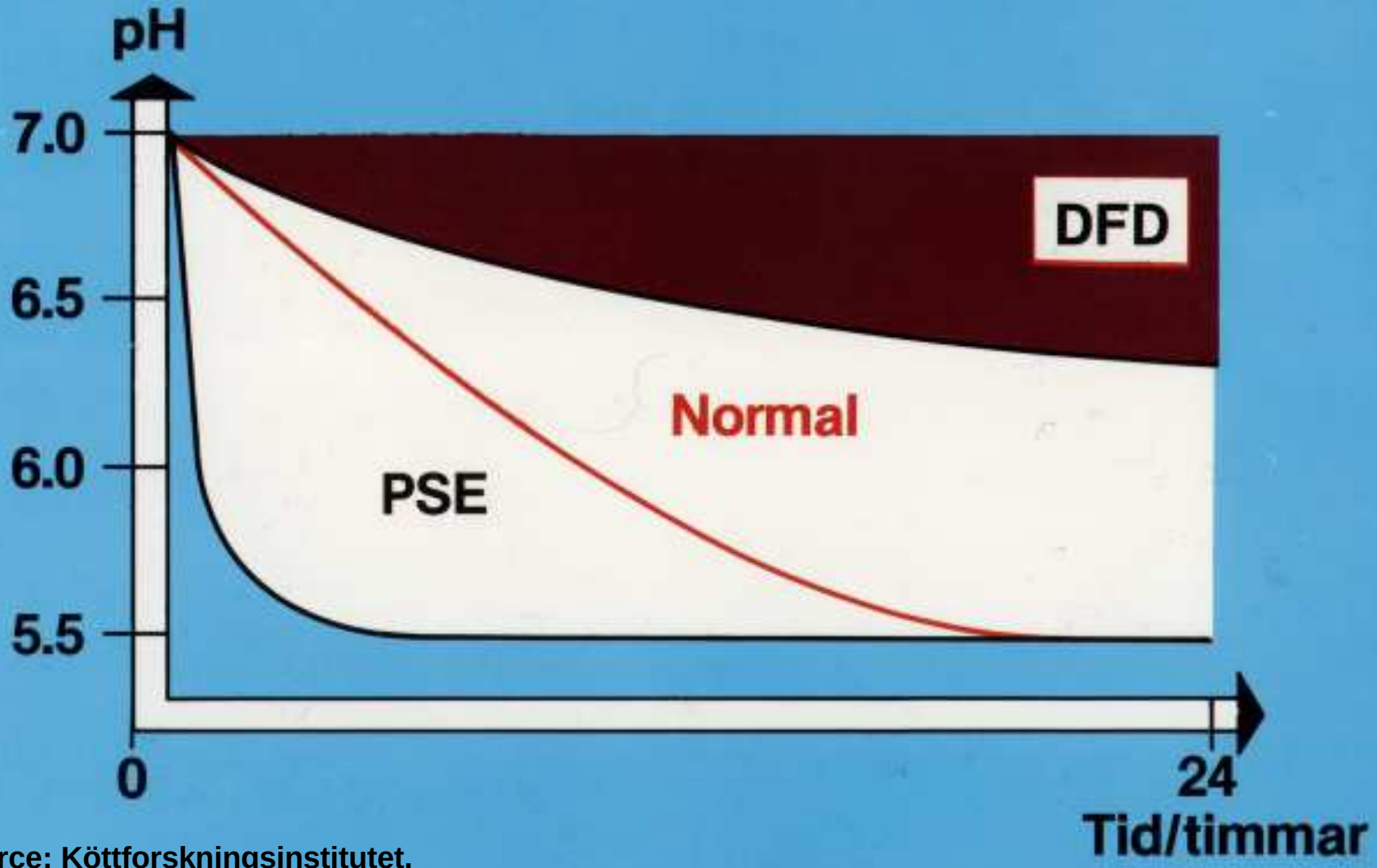
Ethical quality

- How is the meat produced?
- What have the animals been fed?
- How have the animals been handled/transported before slaughter?

What affects meat quality?

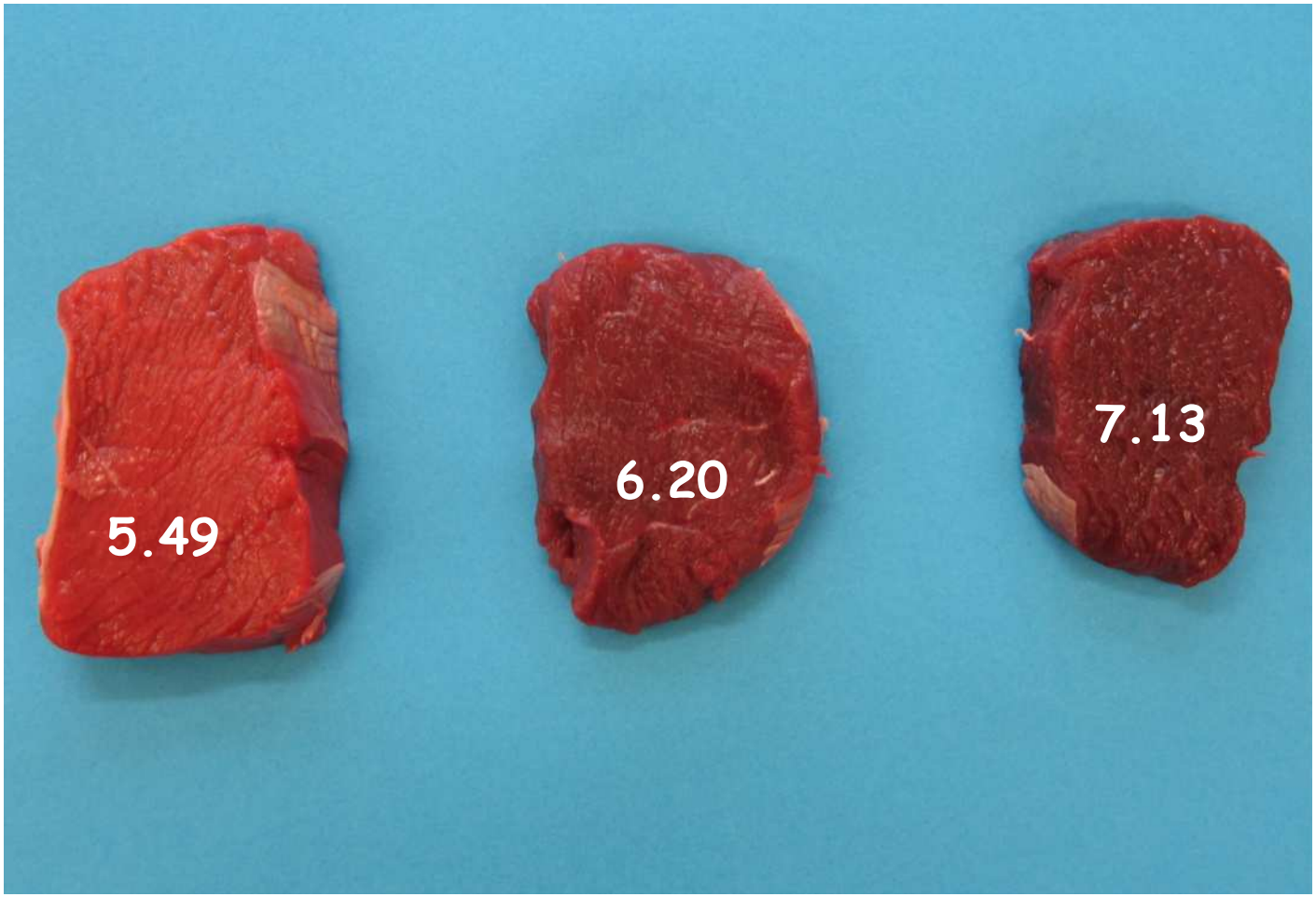


Meat pH affect shelf life, tenderness, colour and water-holding properties



Source: Köttforskningsinstitutet, Sweden

Colour and pH



pH and colour of venison samples chilled at -1.5 °C for 3 weeks

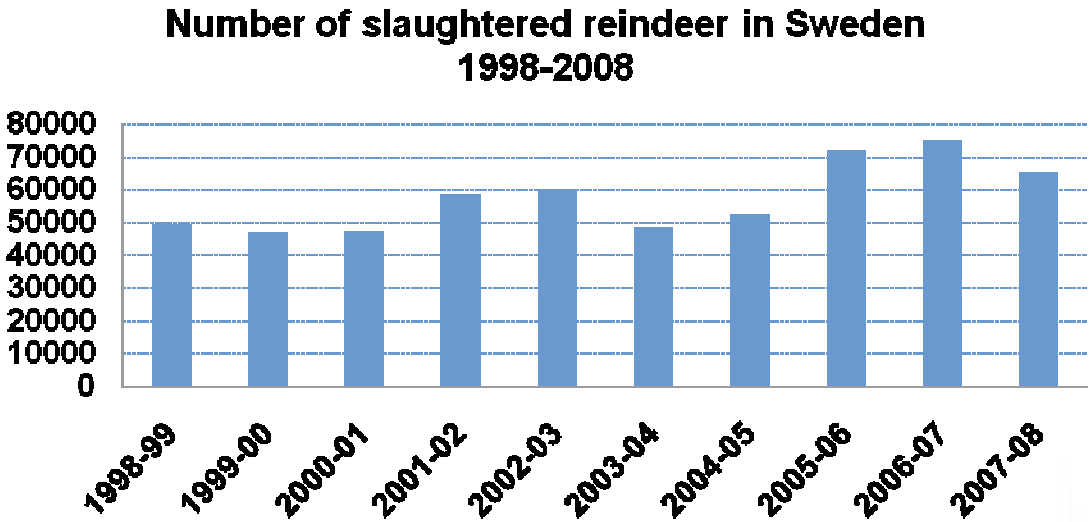
Source: AgResearch

Tenderness and pH

Valid for beef and red deer venison

pH value	
5.5 – 5.8 (normal pH value)	Tender meat
5.8 – 6.2 (intermediate pH)	Tougher meat Inconsistent quality
> 6.2 (high pH, DFD meat)	Tender meat

Reindeer husbandry and meat production in Fennoscandia



Average carcass weight = 27 kg

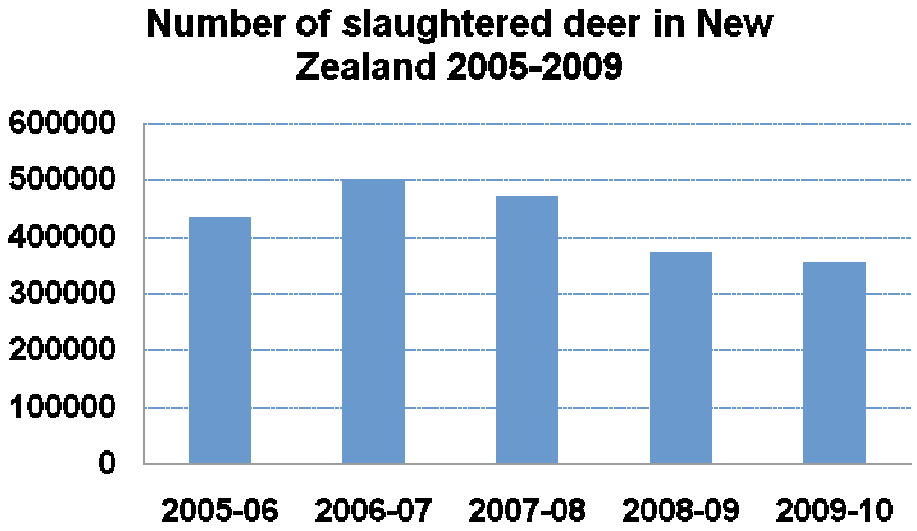
20 EU-licensed stationary and mobile reindeer slaughter facilities in Sweden.

Rules for slaughter similar to domestic species; transport guidelines, *ante* and *post mortem* veterinary inspection, stunning, slaughter hygiene, grading and chilling.

Red deer farming and venison production in New Zealand

Deer QA "gate to plate" program:

Provide total quality assurance to present the best possible venison to the market



Average carcass weight = 55 kg

17 licensed deer slaughter plants.

Rules for slaughter similar to domestic species; transport guidelines, *ante* and *post mortem* veterinary inspection, stunning, slaughter hygiene, grading and chilling.

Pre-slaughter handling, stress and pH surveys in deer and reindeer

	Ultimate pH (overall means)	Intermediate pH	High pH
Red deer (n=3,500)[1]	5.64	9.1%	1.5%
Fallow deer (n=100)[1]	5.93	68.3%	1.0%
Reindeer (n=3,400)[2]	5.67	23.1%	6.0%

- Handling, lairage and behaviour at the plant not linked to pH
- Fallow deer difficult to handle
- Poor nutritional status identified

- Selection using the lasso identified as a stressful and glycogen depleting routine
- Poor nutritional status also causing high pH values

Tenderness and ageing

No electrical stimulation, animals 1.5 – 2 years old, *M. longissimus*

	Shear force 1-3 days *post mortem*	Shear force 1 week *post mortem*
Beef (n=8)[1]	11.7	9.8
Red deer (n=7)[2]	11.4	8.2
Fallow deer (n=8)	5.4[3]	4.5[4]
Reindeer (n=8)[5]	2.9	2.6

- High proteolytic activity demonstrated in reindeer, red deer and fallow deer venison. Not specifically due to high concentrations of proteolytic enzymes but also to low levels of inhibitors to these enzymes
- Small muscle fibre size in reindeer
- No need for ageing reindeer meat

[1]Barnier et al., 1999
[2]Wiklund et al., 2001
[3]Sims et al., 2004
[4]Volpelli et al., 2003
[5]Wiklund et al., 1997

⇐ Fatty acids ⇒

Venison has a low fat content. But the fatty acid composition is important for shelf life (lipid and colour oxidation) and for the quality of processed products.

Is the "Meat of Kings" also the King of Meats?

Venison is unique – special attributes to mention:

Tenderness +

Drip loss –

Colour stability –

Other consumer appealing qualities are low fat content, favourable fat composition and high levels of minerals.


Natural


Exotic


Exclusive


Nutritious

Acknowledgements

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