Nederlandse Voedsel- en Warenautoriteit
Ministerie van Landbouw, Natuur en Voedselkwaliteit

Risks in the red meat and big game supply chain

BuRO/NVWA

2-3 October 2024

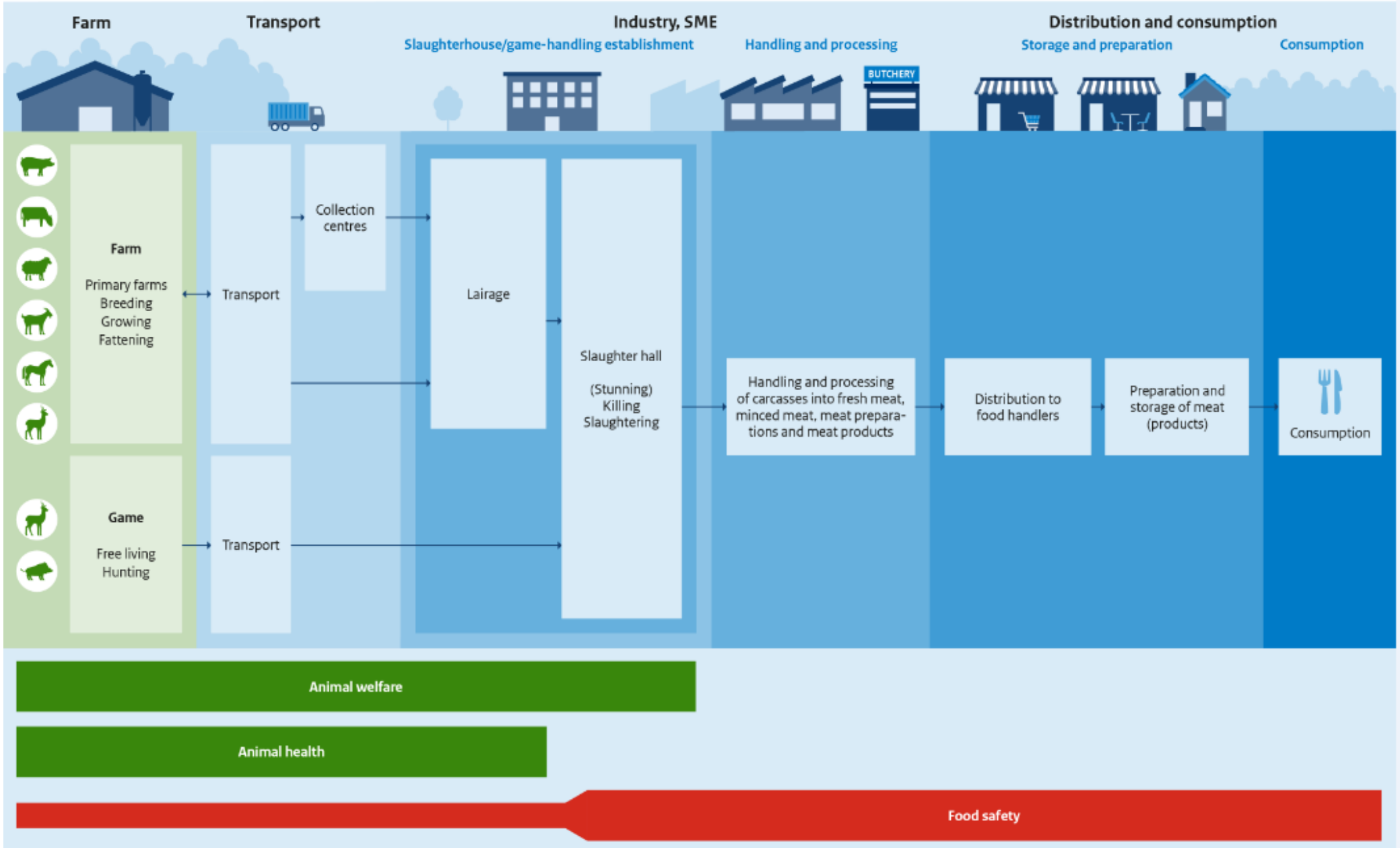
Food supply chain risk assessments

- 12 food supply chains in all domains NVWA
- Multi-annual risk assessment
- Public values NVWA:
  - Food safety, animal welfare, animal health, plant health, environment, product safety, tobacco control
- Risks
  - chemical, microbiological, physical, biodiversity, phytosanitary, animal welfare, etc.
- Insight in hazard dynamics
  - Between chain links, within one chain link
  - Between production supply chains
- Multidisciplinary teams
  - Veterinarians, animal scientists, chemics, food technologists, microbiologists, behavioural scientists, etc.

Scope 2nd red meat and big game supply chain risk assessment

- From living animal to professional kitchen
- Animal species held for meat production and/or consumed in NL:
  - cattle, swine, goat, sheep, horse, deer, boar
  - differences in scope between public domains following from relevance
- For animal welfare:
  - farm, transport (NL and long distance from NL) and slaughterhouse
  - only farmed animals (no wild game)
- For animal health :
  - notifiable animal diseases
- For public health
  - antimicrobial resistance
  - food safety
    - alimentary route (i.e. intake, no contact/inhalation)
    - chemical, physical, microbiological

Production chain of red meat and game



How ... out

Of the total meat export value of 8,8 billion euros, from the Netherlands (including to other EU countries, and including poultry meat), 85% consists of export of meat that was produced or processed in the Netherlands, while 15% consists of export of meat that was imported from abroad and again exported.

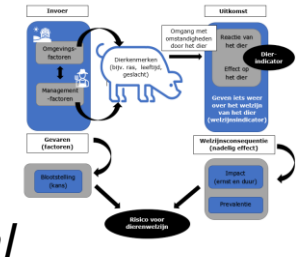
***Note**: t*

Rounded ... nals combined with none ... ompare.

	Kept for meat production*	Import live animals*	Import meat (kg)*	Slaughtered **	Export live animals *	Export (kg meat)*
cattle	55-60.000	225.000	491.000.000	475.000	253.000	599.000.000
veal	1.600.000	862.000		1.591.000	98.000	
swine	12.000.000	2.100.000	417.000.000	15.687.000	11.300.000	1.300.000.000
sheep	918.000	79.000	90.000.000	567.000	160.000	33.600.000
goat(kid)	114.000****	14.000	54.000	197.000	10.000	1.100.000
Horse (solipeds)	Vrijwel geen (vnl. sportpaarden)	3.800	11.000.000	2.000	14.000	9.700.000
Total	**14.692.000**	**3.283.000**	**1.009.054.000**	**18.519.000**	**11.835.000**	**1.404.300.000**

* (WEcR, 2021) **MANCP 2020 ***I&R, RVO*

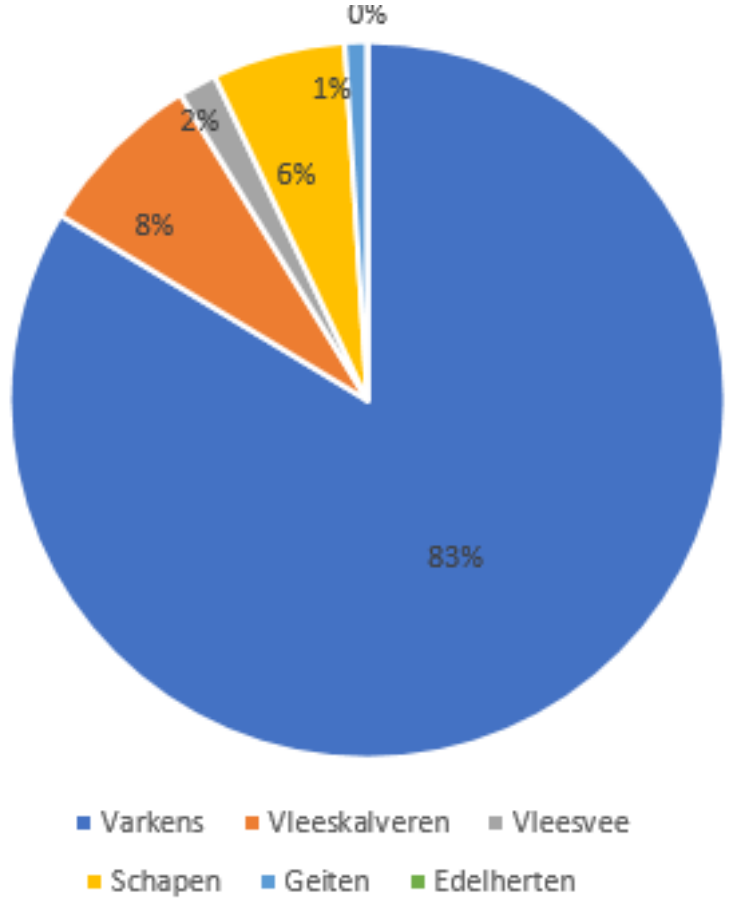
Animal welfare

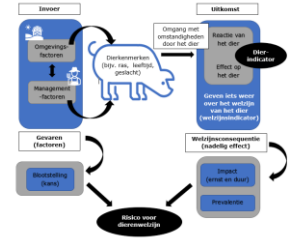


Findings AW - general

- **AW risk anno 2024 not substantially decreased since 2015, or at same level**
  - No suitable or appropriate housing and feeding are (still) important causes of multiple welfare consequences for multiple animal species.
  - Still largest risks for swine and veal calves
  - Still lack of appropriate field data on AW
- **Even when meeting legal requirements: many animals of different species suffer from multiple animal welfare risks throughout the whole supply chain**
  - Human action or absence of actions are important causes
- **Risks for AW in intermediate segment and organic segment seem lower compared to regular farming.**
  - Nevertheless, AW risk still exist.
- **At population level: rare AW issues that receive most social attention do not represent most important AW risks**
  - Because it affects relatively few animals (f.e., very few conscious pigs entering hot water tanks in slaughterhouse vs. many animals experiencing heat stress)

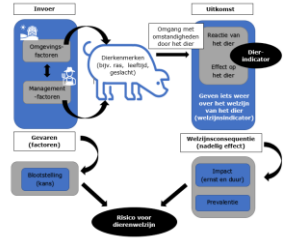
Percentages of total number of animals





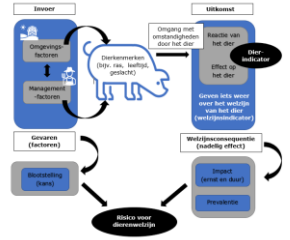
Main risks AW swine

- Restricted feeding of pregnant sows→ hunger
- Insufficient enrichment→ discomfort for not being able to perform natural behaviour, and development of undesirable behaviour (like tail biting)
- Fixation of sows in maternity box → stress
- Early and abrupt weaning → stress
- Lack of ability to perform sexual behavior (heat detection) boars → frustration
- Enzootic pneumonia → potentially many animals ill for prolonged period (dry cough, light fever, some loss of appetite)



Main risks AW veal calves

- No access to drinking water (individual housing) → thirst
- Slatted floors → reduced comfort in lying, reduced possibility for expressing playing behaviour
- Supply of milk (too much at once), too little or unsuitable roughage → abomasum ulcers
- Too high animal density → lack of space and limited possibility to express playing behaviour
- Multifactorial AW issues, i.e. transport and mixing animals from different origin→ respiratory problems



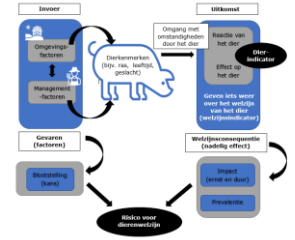
Main AW risks transport

- Long transport of young animals (calves, piglets) →
  fear, pain and stress; some animals not fit for transport
- Transport of cull cows/sows via collection centres

  → fear, pain and stress; some animals not fit for transport
- Transport at high ambient temperatures

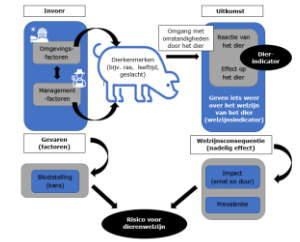
  → heat stress (weaned pigs, fattening pigs)
- Fasting prior to transport

  → hunger (pigs, all categories)

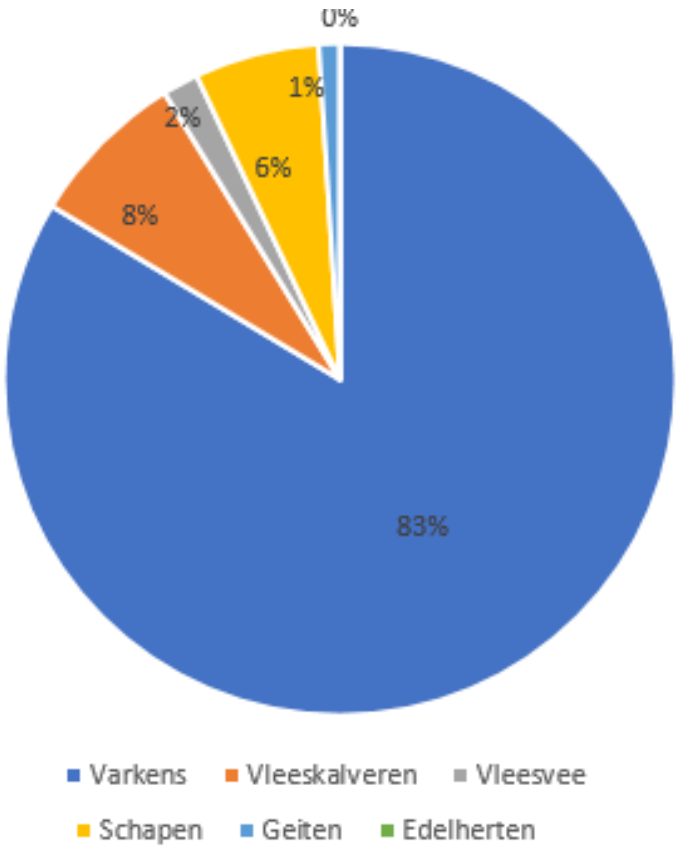


Main AW risks slaughterhouse

- Slaughter practices/slaughterhouse interior/(staff): stress
  - chasing
  - fixation
- Strange surroundings (cows, beef cattle, calves, sheep) → stress
- Slaughter of cattle and sheep without stunning → pain, stress
- No access to feed or water, mixing of animals (fattening pigs, sows) → hunger, thirst, stress
- Moving animals to electrical stunner (fattening pigs, sows) → stress



AW in relation to lifespan

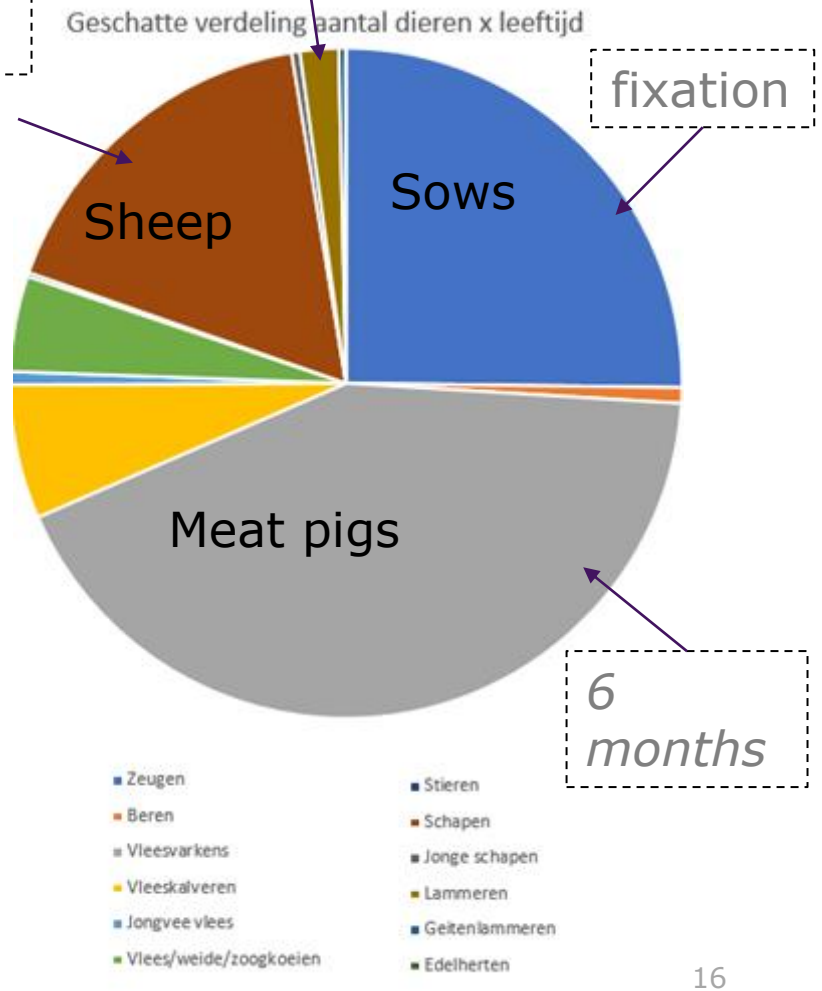


When, apart from numbers, also lifespan and animal category are considered, a different view appears:

Anthelmintic resistance

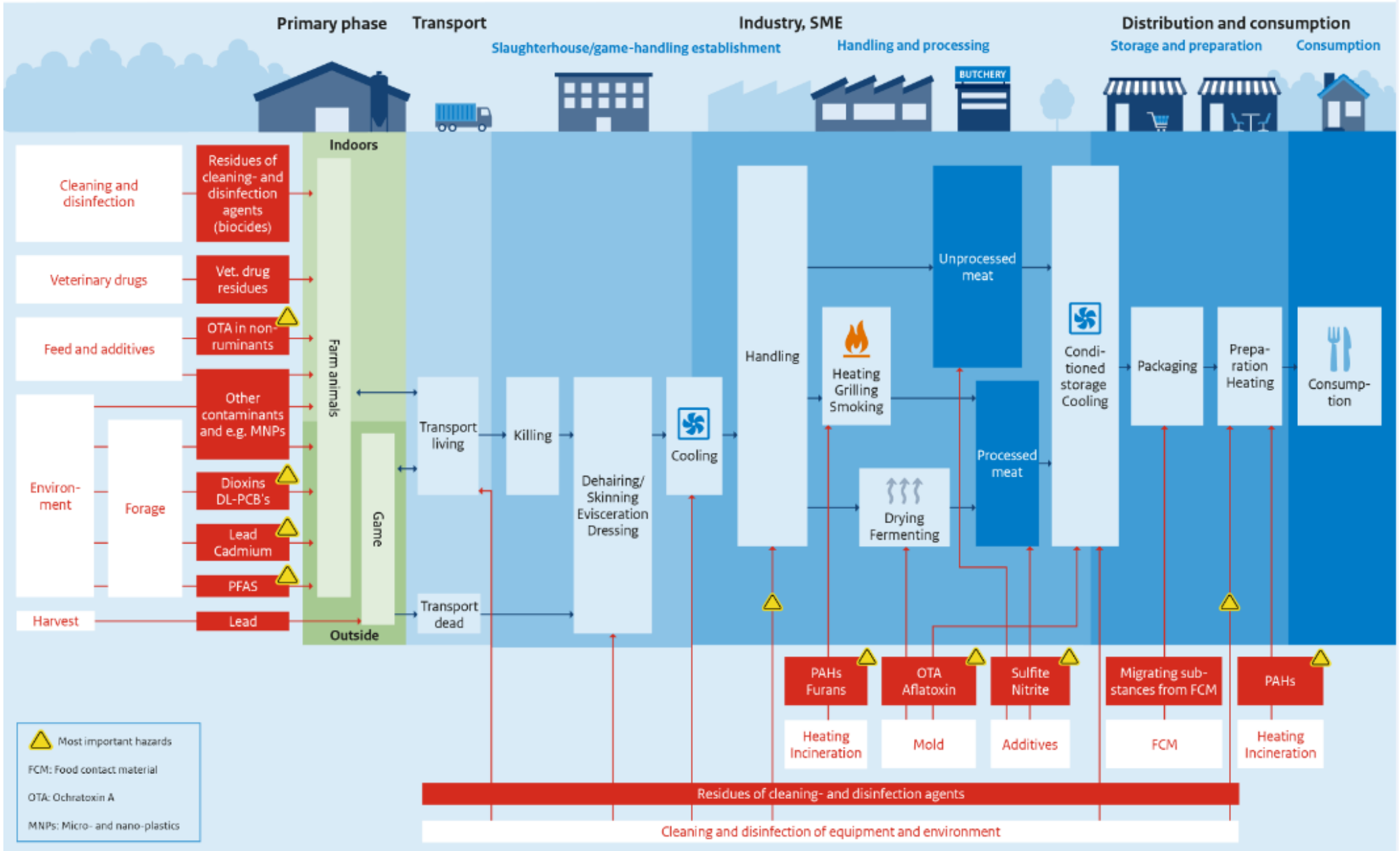
BTV, heat

fixation



Food safety

Food safety of red meat and game - prioritised chemical hazards



Physical food safety

- Wild game: chance of ammunition and bone fragments left behind due to shooting
- Very limited risk for other animal species, due to good control (small chance)
- At personal level severe effect can occur

Antimicrobial resistance

- Antibiotics used in veterinary and human health care
- Resistance by exposure of bacteria to none-lethal concentration
  - Prescribed treating schedule not tailored to this new insight
  - But still obliged to adhere to the treatment schedule
- There is no legal basis for banning foodstuffs containing resistant bacteria from the market if there are no limits for the sensitive form

→ See also previous advice from BuRO: Advisory Report by BuRO concerning the implementation of regulations that will regulate veterinary usage of antibiotics | Risk analysis | NVWA-English

Transmission of pathogens

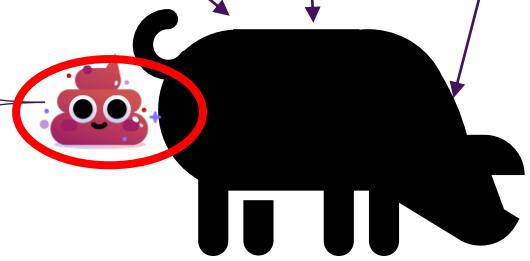
Primary phase import and introductory route

Liver, blood: HEV

Muscles: *Toxoplasma*

Tonsils: *Yersinia*

Salmonella
Campylobacter
HEV
Yersinia
STEC
Listeria



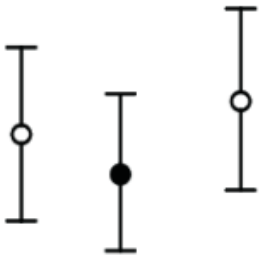
Feces
Pests
Feed
Other farm animals

Insufficient hygiene and faecal contamination important contamination route of animals and meat

Note:
- *Slaughterhouses regularly do not meet legal standards*
- *in EU: slaughterhouses report less Salmonella in the verification study of EU process hygiene criteria than EU competent authorities do*

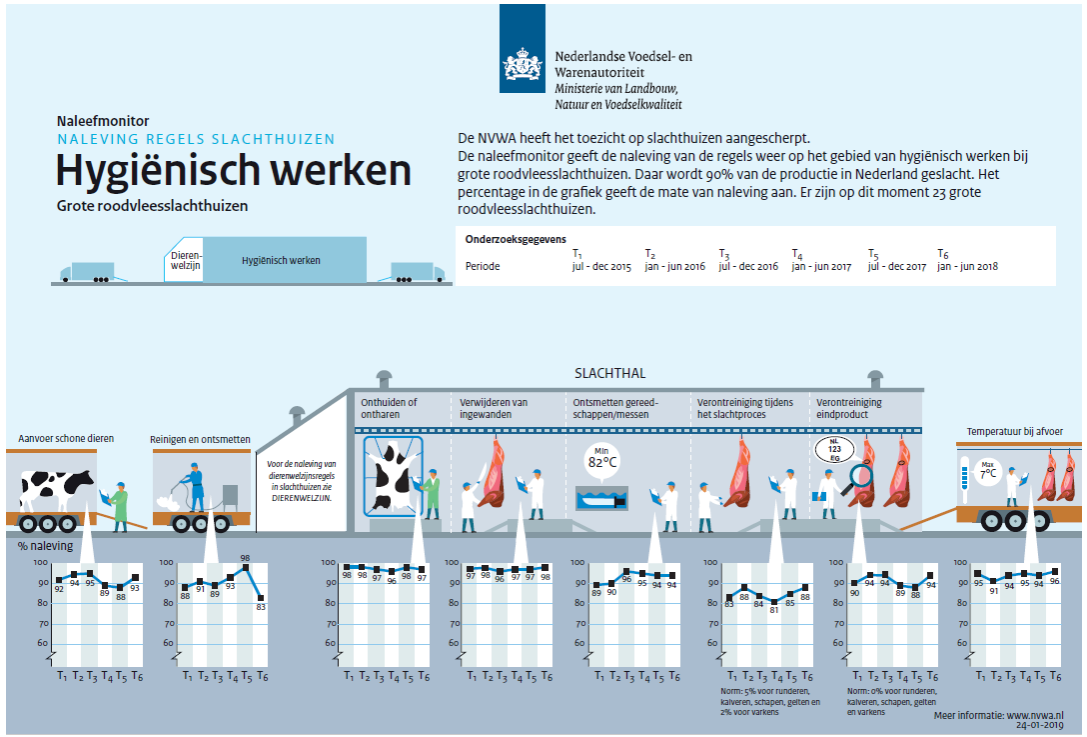
Microbial food safety

- Consumption of undercooked meat important route
  - Good hygiene and sufficient heating continues to be important for mitigating risks
- Of the animal species:
  - Beef highest contribution to disease burden
  - Per consumption unit: meat of goat/sheep comparable risk
- *T. gondii* and *Y. enterocolitica:* high uncertainty in estimates



Current focus of supervision in slaughterhouse

- Lots of manpower compared to the primary phase, retail, import
- Food safety
  - High efforts chemical food safety controls
  - Supervision on hygiene
    - Mainly in larger slaughterhouses
    - Often do not meet the standard
  - Food chain information
    - Little feedback to previous or following links in the chain
- Supervision of AW afterwards
  - Impairment of well-being is already a fact



Finally

- With respect to red meat chain: focus on early phase of chain remains important
  - For both food safety AND animal welfare
- Much of the meat produced in the Netherlands ends up abroad

  - but risks AW within the NL
- Integrated food chain analyses
  - Different public domains are assessed simultaneously
  - Fits in OneHealth approach
  - Has gained interest by WHO
  - Offers opportunities to weigh different public interests and different food chain links for the purpose of risk-oriented supervision
    - Consideration framework
- Environment/nature out of scope
  - Will receive more attention in future chain risk assessments

Acknowledgements

- The ‘red meat team’ and other BuRO colleagues
- Involved colleagues NVWA
- The stakeholders for fact check

- And thank you for your attention and helpful discussions