Remote Meat Control
-from opportunity to obligation?

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What I am going to talk about?

- Some challenges in meat control – Swedish context
- Digital transformation - possibilities
- What can we do to get success?
- Drivers in Swedish context
- What have we done?
- What are we doing?
- Best case scenario – our vision
- Conclusion!
Meat inspection today - challenges

- Meat control has to be done on the site, physically
- Lot of travelling to Ante Mortem and Post Mortem inspection and control
- Calibration of the meat control is a demanding task - personnel cannot take "a day off" for internal training
- In case of extrem weather or other external hurdles meat control can be hampered → logistic problem for abattoir or game handling establishment
- In case of internal hurdles (lack of personnel) meat control can be hampered → as above
**Swedish meat production – red meat**

**Slaughtered domesticated animals 2021**
- Pigs about 2 650 000
- Cattle about 400 000
- Sheep about 227 000


**Semi-domesticated reindeer 2021**
About 50 000 reindeer slaughtered

Source: [www.slv.se](http://www.slv.se)

**Wild game shooting 2020**
- Wild boar 166 000 (11 % to GHA)
- Roe deer 118 000 (5 % to GHA)
- Moose 83 000 (6 % to GHA)
- Fallow deer 80 000 (21 % to GHA)
- Red deer 10 000 (26 % to GHA)

(Totally 75 000 carcasses to GHA)

Source: [https://rapport.viltdata.se/statistik/](https://rapport.viltdata.se/statistik/)
13 red dots are reindeer abattoirs up and running seasonally (top season in November-December)

7 blue dots are offices for official control veterinarians and auxiliaries

- During 2021 about 50,000 reindeer slaughtered in 12 reindeer abattoirs
- During 2021 control staff was driving by car for meat inspection about 60,000 kilometres
- 24 kg mean carcass weight → 1,200 ton meat
- 20 kg (0.8 carcasses) per 1 kilometre

There are another 153 small abattoirs for other species and game handling establishments in Sweden
Digital transformation – on-going process

• Pandemic →
  • a weak up call for many businesses and authorities
  • Expanding digital services became an imperative - impossible to engage in an analog way.
• Food control →
  • Some inspections OK to do on distance during pandemic, NOT meat inspection
  • Digital systems in documentation exist already
  • Different authorities along the food chain – hurdles in sharing information
• Food businesses →
  • Already many digital systems in production environment
  • Big companies first in line, even smaller using digital tools in some cases
Public sector – much more needed

• Studies reveals – public sector not as digitalized as it should 
  (Digitaliseringskommissionen, 2016)

• Reluctance exists in all levels of an organization, whole society

• Reluctance
  • personnel background diversified
  • Normal human behaviour
  • Economical reasons – public funding?

• Digital ecosystems > < psychological contract
  (the mutual beliefs, perceptions and informal obligations between an employer and an employee, by Denise Rousseau, 1989)
  • Does it work?
Possibilities to develop control

- In Official Control Regulation (EU) 2017/625 of the European Parliament and of the Council, Article 16.2:

  “When adopting delegated acts and implementing acts provided for in this Section, the Commission shall take into account the following:


  (b) scientific and technological developments.......................”
Actual demands of consistency and effectiveness


  “Where, for the same area, a Member State confers the responsibility to organise or **perform official controls** or other official activities on more than one competent authority, at national, regional or local level, or where the competent authorities designated in accordance with paragraph 1 are allowed by that designation to transfer specific responsibilities for official controls or other official activities to other public authorities, the Member State shall:

(a) ensure efficient and effective coordination between all authorities involved and the **consistency and effectiveness** of official controls or other official activities across its territory;
Prerequisites – how to get success

High level of competence in meat inspection
Official veterinarians, auxiliaries and other control personnel

Successful digitalization

Innovation
R & D
With skilled engineers

Digital mindset
Right attitude
In place in every level and every part of the Competent Authority,
In all Member States and third countries

Comprehensive empowerment
starting from
Leading management at CA
In all Member States and third countries
Efforts to develop EU-legislation

Communication with Commission concerning the needs and possibilities supported by the results from research projects

EFSA
Risk assessors for Commission

COMMUNICATION BETWEEN LIKE-MINDED COUNTRIES

Results from all different projects to be published, Denmark, Italy, Norway, Sweden ...
Use technical solutions for calibration of the staff

- Support in actual judgement on line
- Quick and precise information concerning changes in judgements or new findings/sampling
- Planned training of routine meat inspection
- Planned training in control projects
Human judgements – technical support

Ethical aspects has to be considered
Support to mitigate bias and noise
The staircase of communication

Awareness

Understanding the relevance

Remembering

Attitudes and values → acceptance

Behavior, action

TO KNOW

TO FEEL

TO DO
Drivers in Swedish context

The global and national sustainability goals

- Reduce the official meat control’s environmental burden
- Create higher level of resilience in the food chain
Drivers in Swedish context

Logistic hurdles →
constraints on
➢ production and
➢ profits
in small abattoirs and GHE

Calibration of control →
➢ Impartiality
➢ Quality
➢ Consistency

Agenda 2030

National Food Strategy

National Sustainability Goals
What have we done?
Remote control projects

The goals in study with digital technics in meat inspection 2019:
• Clarify the practical and technical needs and inventory of technical solutions
• Assess the reliability of the inspection,
• Assess the overall consequences for food safety, infectious disease control and animal protection
• Assess the technical functionality

Very few findings and lot of bias in Ante mortem inspection with smart phones and augmented reality.
Reliability of PMI on distance is approximately equivalent with PMI on-site.
Technical functionality of normal smart phone is good enough
Main hurdle is the bandwidth and other problems with Internet.
A great potential to use AI as a possible tool to automate pig PMI, in particular the carcass.
Pandemic stopped practical work in abattoirs 2020
Project plan modernization 2021 -2023

All the time meeting the goals for good food safety, animal welfare and animal health !!!
Remote PMI in vivo done 2021

Preliminary results:

- The main hurdle is the bandwidth in the positions for PMI
- Wi-Fi router needed inside the “Faradays cage”
- Smart phone a useful device
- Good technical assistance on-site a basic condition needed
Feasibility of remote AMI – 2022 - 2023

- Behavioral study up and running
- Practical AMI at small abattoir by smart phone up and running
- Focus on screening hurdles, possibilities and solutions
- Testing ”best case” and ”worse case” scenarios
- Further activities according the results
Our future vision

- Meat control can be done
  - on distance when demand exists and circumstances are good enough
  - with technical devices easy to use and reliable, protected from hackers
  - by well calibrated control staff, familiar in use of technical devices

Technical development

→ MI popular as working field
→ veterinarians, meat inspectors and engineers
work together in
a good working environment
supported by new technics
Inaction not an option!
Thank you for your attention!