Modernization of meat inspection in a Swedish context

RIBMINS online conference
15 October 2020

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Activities performed 2018-2020 and ongoing

1. New management model - indicators
2. Better equivalency of official control – system of nodes
3. Masseter incision not compulsory in post mortem inspection (PMI) of bovines
4. Representative sample in ante mortem inspection (AMI) and PMI of poultry
5. Remote PMI by digital augmented reality – research project
6. Imagine diagnostics in meat control – research project

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Part 1 - New management model - indicators

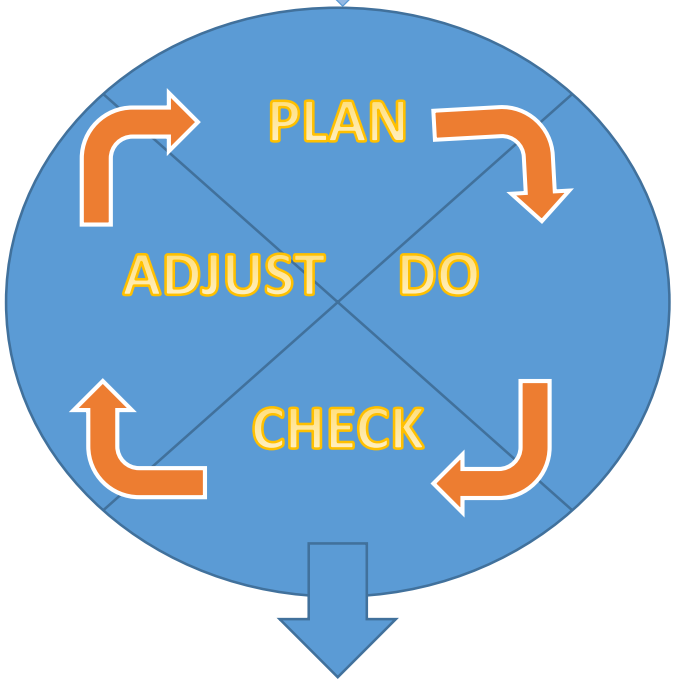
Situation assessment

Defintion in competent authority:
- What is our mission
- How to understand the mission
- -What is our target, target image

Efficiency

- Economical indicators
- Productivity indicators
- Working environment indicators

Differences between departments and teams in control analyzed



Indicator analysis

Effectiveness

Control indicators at the moment

- Number och suspected uncompliances in primary production noted in AMI and reported to county veterinary office
- Number of findings in AMI
- Number of decisions in PMI
- Number of decisions in PMI
- Number of uncompliances in control of FBO

Possible differences between departments and teams in control analyzed

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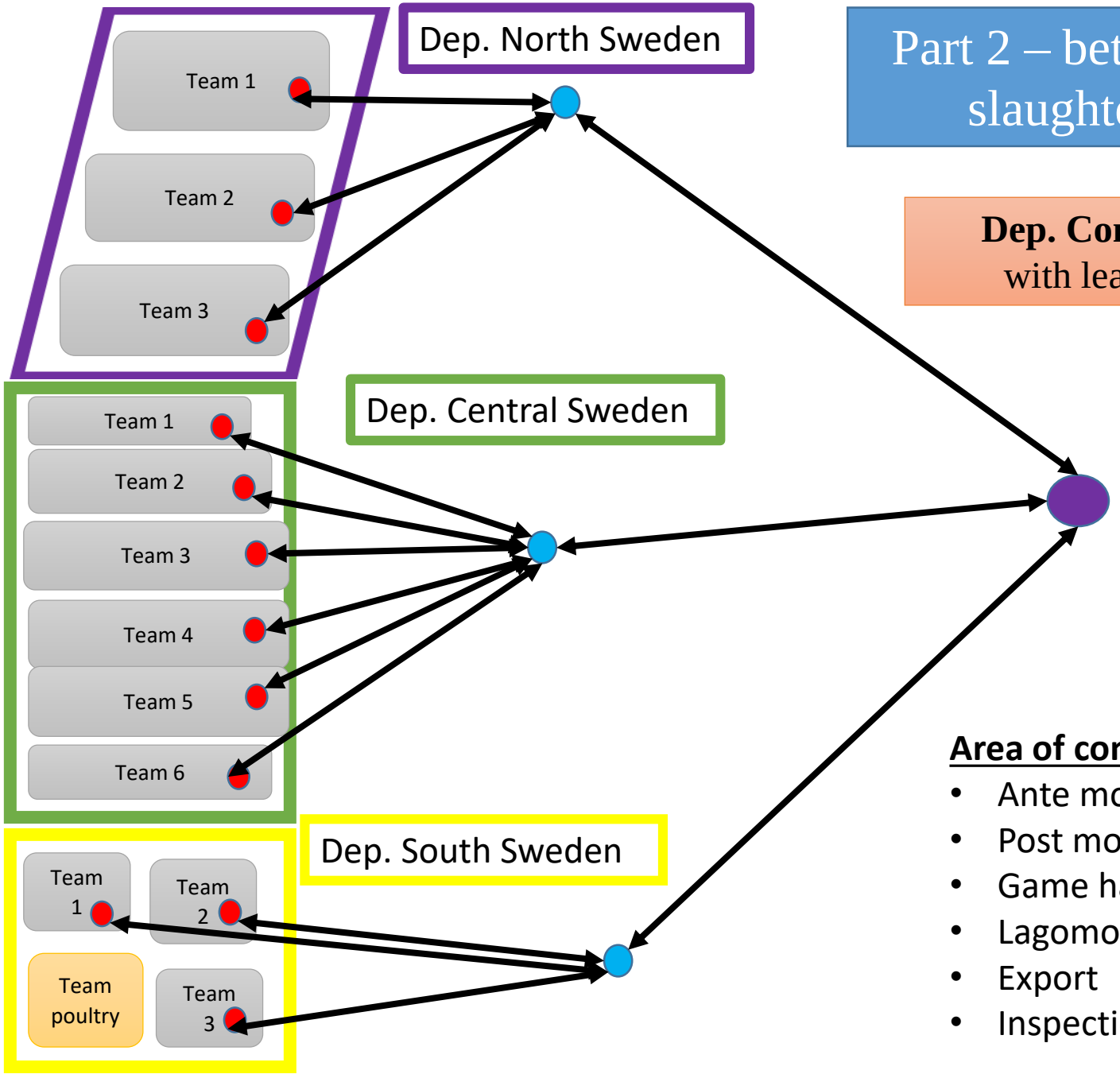
Part 2 – better equivalency of official control in slaughter and game handling and export



Dep. Control Support
with leading experts

Team node = TN
Expert node = EN
Leading expert = LE

Recources in use:

6 Area of competence (AC)
12 team nodes per AC
3 expert nodes per AC
1-2 leading experts per AC

Team poultry only one team

Area of competence (AC):

- Ante mortem inspection and animal welfare
- Post mortem inspection
- Game handling
- Lagomorphs (TN only in teams with activity)
- Export
- Inspection/revision/approval of Food Business Operators

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Part 3 - Masseter incision not compulsory in PMI of bovines

Article 30 in Regulation (EU) 2019/627 concerning PMI and cysticercosis in domestic bovine animals

→ **Principals of risk analysis used**

Risk assessment :
- Low increase in exposure expected
- Mild symptoms in case of infection
- Incision increase the risk of cross contamination with high-priority pathogens for ex. STEC

An overall assessment is that cessation of muscle mass cutting does not significantly increase the risk to public health of *Taenia saginata* infection

Risk management decision done 2020 February → no routine cutting from 1 March 2020

Follow up of short time effects planned 2021 concerning:
- Cost reduction
- Working environment
- Prevalence of STEC and Salmonella
- Prevalence of antibiotic- resistant bacteria

New information → possible new and different risk management decision

Swedish data: zero cases during 2018 and 2019

Part 4: Representative sample in AMI and PMI of poultry

Article 25 in Regulation (EU) 2019/627 concerning PMI of poultry

Principals of risk analysis used

Risk assessment:

- Analysis of mortality in flocks coming to slaughter houses and possibility to find the dead birds in AMI
- Analysis PMI on going

Risk management decisions:

- AMI alternatives under consideration
- PMI alternatives under consideration

Other legitimate factors/demands for PMI:

- FCI okay
- AMI no findings
- HACCP on place and without uncompliances

Hurdles:

- PMI data not comprehensive in every slaughter house
- PMI data not equivalent between slaughter houses

AMI Data obtained from poultry slaughter houses

PMI Data obtained from poultry slaughter houses

Final report
December 2020

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Part 5 -Remote PMI by digital augmented reality – research project

The aim:
Study new digital technics as solution for meat inspection.

The goals:
- Clarify the practical and technical needs and inventory of technical solutions and companies,
- Assess the reliability of the inspection,
- Assess the overall consequences for food safety, infectious disease control and animal protection
- Assess the technical functionality

Material and methods:
Totally 400 pigs PMI and AMI.

Material and methods:
Totally 400 pigs AMI.
Every same box of living pigs
- By OV1 on-site 200 pigs
- By OV2 on distans 200 pigs
- By OV1 on distans 200 pigs
- By OV2 on-site 200 pigs

Very few findings and lot of bias.
New project 2021
under consideration

PMI on-site, n=400
Every same carcass and offal
By OV1 200 pigs
By OV2 200 pigs

PMI on distans, n=400
Every same carcass and offal
By OV1 200 pigs
By OV2 200 pigs

Recorded material, n=400
PMI by OV1
PMI by OV2
PMI by 9 new experienced OVs

Statistical analysis compared different OVs and methods

SFA – efforts to change the legislation

Conclusions:
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.

Hultgren Jan et al. 2020. Modernized meat inspection at slaughter and wild game processing. Final report. Swedish University of Agricultural Sciences.

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Part 6 - Imagine diagnostics in meat control – research project

Feasibility study during 2019

The aim:
investigate the possibilities of automated image (AI) diagnostics as a tool in the official post mortem meat inspection (PMI) of slaughtered pigs.

The goal:
- map the environment in which an AI-system will operate
- determine the demands for such AI-system
- Suggestions how to proceed in developing AI in PMI

Results:
a great potential to use AI as a possible tool to automate pig PMI, in particular the carcass.

Further practical study on-site during 2020

Device installation on-site → Collection of images → Image annotation, supported by the PMI done on site → Validat… → …al report March 2021

Started last week, at last!

Rydberg, Anna et al. 2019. RISE, Research Institutes of Sweden, Uppsala