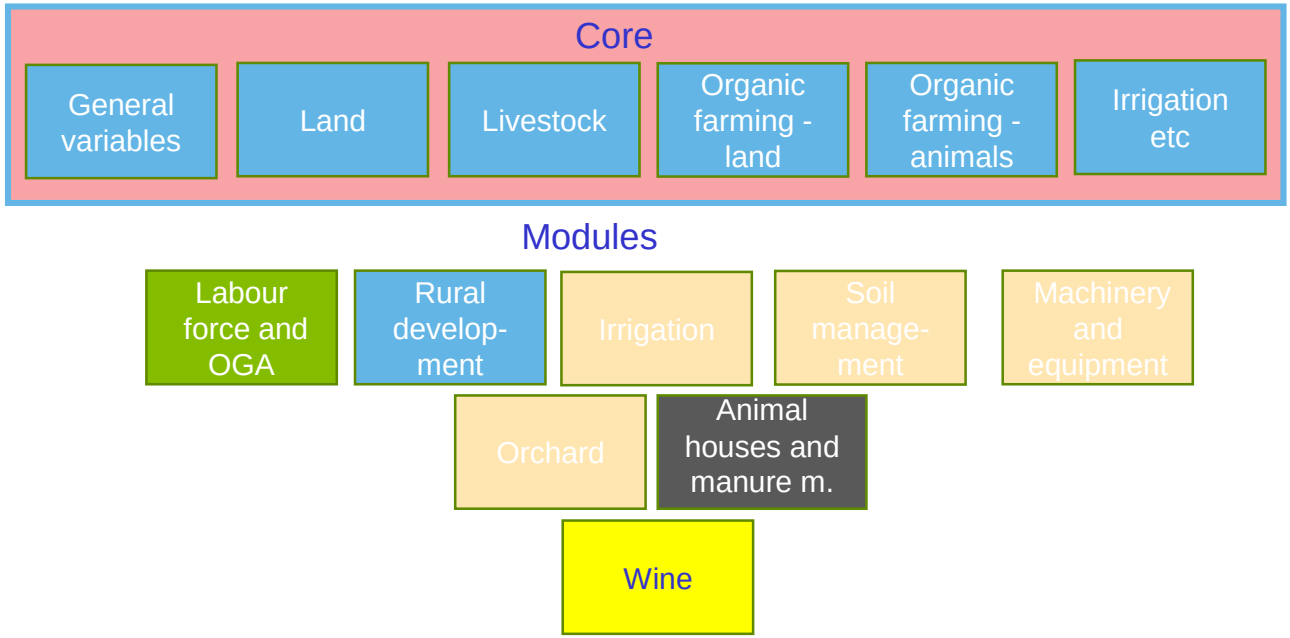
Animal housing and manure management IFS2020- Inovative aproach

How we invented a completely new "innovative" way to set variable values at holdings in IFS2020

or …

the art of creating a stressful existence

IFS2020



Census 2020 and 2023?
Sample survey 2020 och 2023
Innovative method 2020, ej med 2023
Not included 2020 samplel 2023
Not included 2020, 2023, included 2026

2023-10-03

Animal housing and manure management IFS2020 - Innovative aproach

From IFS-regulation

Article 4

Data sources and methods

1. For the purpose of obtaining the data referred to in this Regulation, Member States shall use one or more of the following sources or methods, provided that the information allows for the production of statistics that meet the quality requirements laid down in Article 11:

(a) statistical surveys;

(b) the administrative data sources specified in paragraph 2 of this Article;

(c) other sources, methods or innovative approaches.

2. Member States may use information from the integrated administration and control system (IACS) established by Regulation (EU) No 1307/2013 of the European Parliament and of the Council ([2]), the system for the identification and registration of bovine animals established by Regulation (EC) No 1760/2000 of the European Parliament and of the Council ([3]) and the system for the identification and registration of ovine and caprine animals established by Council Regulation (EC) No 21/2004 ([4]), the vineyard register implemented in accordance with Article 145 of Regulation (EU) No 1308/2013 of the European Parliament and of the Council ([5]), and the organic farming registers set up pursuant to Council Regulation (EC) No 834/2007 ([6]). Member States may also use administrative sources associated with specific rural development measures.

3. Member States which decide to use the sources, methods or innovative approaches referred to in point (c) of paragraph 1 shall inform the Commission (Eurostat) during the year preceding the reference year and shall provide details concerning the quality of the data obtained from that source, method or innovative approach and the data collection methods to be used.

Animal housing and manure management IFS2020 - Innovative aproach/modeling

From Handbook

2.3.3 Other sources

Member States which decide to use the sources, methods or innovative approaches referred to in Article 4 (1) (c) of Regulation (EU) 2018/1091 (other sources, methods or innovative approaches) shall inform the Commission (Eurostat) during the year preceding the survey reference year and shall provide details concerning the quality of the data obtained from that source, method or innovative approach and the data collection methods to be used.

Animal housing and manure management - modelling

Background

- Information on animal stables and fertilizers has been collected at various times in connection with FSS. 2010 in SAPM and 2016 in FSS.
  - High partial non-response
  - Difficult questions in survey form - uncertain quality
  - Risk of it affecting the response frequency of other parts
  - For national needs, Statistics Sweden conducts a fertilizer and manure survey every three years

  - A lot of information is available in different places - however, not collected in a register
    - Information from different advisory organizations
    - All new animal houses has to be reported and apporved by the county board
    - Every third year Statistics Sweden conduct a survey on manure
    - In 2010 and 2016 there where parts of this area in the FSS
    - The cattle register and then production place register has a lot of information

Animal housing and manure management - modeling

Modeling – What is it?

How can we, based on existing information, make a model that satisfactorily produces an expected response for each variable in the company.

- Direct or indirect imputation
- Relationship to other variables
- To get x, we can ask about y instead
- Use existing registers
- Combination of different solutions
- Regional conditions
- Rules that govern

Animal housing and manure management - modeling

Way of working

1. In 2019, we investigated which sources exist, what they contained and whether we can access data from them.
2. We looked at data from a lot of sources. How do these fit in with the variables we will investigate. Connections to Farm Register etc.
   a) Exact match against IFS variables
   b) Correlation to IFS variables
   c) Other ways to estimate IFS variables
3. Split the module into 3 parts
   a) Animal housing – Anders
   b) Manure management – Ylva
   c) Manure usage - Jesper

4. Decided not to not include these data in questionnaire for 2020 but to try modeling.
5. In 2021, this would be realized in practice
   a) "Order" data from the various sources
   b) Discuss the "reality" with a number of experts on the site, outside the site, etc
   c) Create a method

Animal housing - modeling

Tema: djurstallar			
	Detaljerat tema: nötkreatursanläggning		
MAHM 001	–	Mjölkkor	Genomsnittligt antal
MAHM 002	– –	Mjölkkor i uppbindningsstall (flytgödsel)	Platser
MAHM 003	– –	Mjölkkor i uppbindningsstall (fastgödsel)	Platser
MAHM 004	– –	Mjölkkor i lösdrift/liggbåsstall (flytgödsel)	Platser
MAHM 005	– –	Mjölkkor i lösdrift/liggbåsstall (fastgödsel)	Platser
MAHM 006	– –	Mjölkkor i andra typer av stall (flytgödsel)	Platser
MAHM 007	– –	Mjölkkor i andra typer av stall (fastgödsel)	Platser
MAHM 008	– –	Mjölkkor som alltid vistas utomhus	Platser
MAHM 009	– –	Mjölkkor som delvis vistas utomhus (på bete)	Månader
MAHM 010	– –	Mjölkkor med tillgång till rastgårdar	Ja/nej
MAHM 011	–	Andra nötkreatur	Genomsnittligt antal
MAHM 012	– –	Andra nötkreatur i uppbindningsstall (flytgödsel)	Platser
MAHM 013	– –	Andra nötkreatur i uppbindningsstall (fastgödsel)	Platser
MAHM 014	– –	Andra nötkreatur i lösdrift/liggbåsstall (flytgödsel)	Platser
MAHM 015	– –	Andra nötkreatur i lösdrift/liggbåsstall (fastgödsel)	Platser
MAHM 016	– –	Andra nötkreatur i andra typer av stall (flytgödsel)	Platser
MAHM 017	– –	Andra nötkreatur i andra typer av stall (fastgödsel)	Platser
MAHM 018	– –	Andra nötkreatur som alltid vistas utomhus	Platser
MAHM 019	– –	Andra nötkreatur som delvis vistas utomhus (på bete)	Månader
MAHM 020	– –	Andra nötkreatur med tillgång till rastgårdar	Ja/nej

Dairy Cows

Other bovine animals

	Detaljerat tema: grisanläggning		
MAHM 021	–	Avelssuggor	Genomsnittligt antal
MAHM 022	– –	Avelssuggor på helspaltgolv	Platser
MAHM 023	– –	Avelssuggor på delvis dränerade golv	Platser
MAHM 024	– –	Avelssuggor i anläggning med fast golv (bortsett från djupströsystem)	Platser
MAHM 025	– –	Avelssuggor i anläggning där hela ytan är djupströsystem	Platser
MAHM 026	– –	Avelssuggor i andra typer av anläggningar	Platser
MAHM 027	– –	Avelssuggor som vistas utomhus (frigående)	Platser
MAHM 028	– –	Avelssuggor som vistas utomhus (frigående)	Månader
MAHM 029	–	Övriga grisar	Genomsnittligt antal
MAHM 030	– –	Övriga grisar på helspaltgolv	Platser
MAHM 031	– –	Övriga grisar på delvis dränerade golv	Platser
MAHM 032	– –	Övriga grisar i anläggning med fast golv (bortsett från djupströsystem)	Platser
MAHM 033	– –	Övriga grisar i anläggning där hela ytan är djupströsystem	Platser
MAHM 034	– –	Övriga grisar i andra typer av anläggningar	Platser
MAHM 035	– –	Övriga grisar som vistas utomhus (frigående)	Platser
MAHM 036	– –	Övriga grisar med tillgång till rastgårdar	Ja/nej
	Detaljerat tema: anläggning för värphöns		
MAHM 037	–	Värphöns	Genomsnittligt antal
MAHM 038	– –	Värphöns i anläggning med djupströsystem	Platser
MAHM 039	– –	Värphöns i system för frigående höns (utan strö)	Platser
MAHM 040	– –	Värphöns i burar med gödselband	Platser
MAHM 041	– –	Värphöns i burar med gödselband	Platser
MAHM 042	– –	Värphöns i trappstegsburar med förkulvert	Platser
MAHM 043	– –	Värphöns i andra typer av anläggningar	Platser
MAHM 044	– –	Värphöns som vistas utomhus (frigående)	Platser

Breeding sows

Other pigs

Laying hens

Animal housing- modeling

At review

- Some variables are not allowed in Sweden – for example, pigs are not allowed to walk on fully slatted floors
- Some variables do not exist in practice in Sweden - No dairy cows go outside all year round.
- Rules that affect the results (eg how long animals must go out in different regions).
- Some information from data sources responds to “part“ of the variable.

Animal housing - modeling

Example variables (dariy cows)

- Dairy cows in tied stalls (slurry) – number of places
- Dairy cows in tied stalls (solid manure) – number of places
- Dairy cows in loose/cubicle housing (slurry) – number of places
- Dairy cows in loose/cubicle housing (solid manure) – number of places

➢ Four variables – each variable consists of 3 characteristics

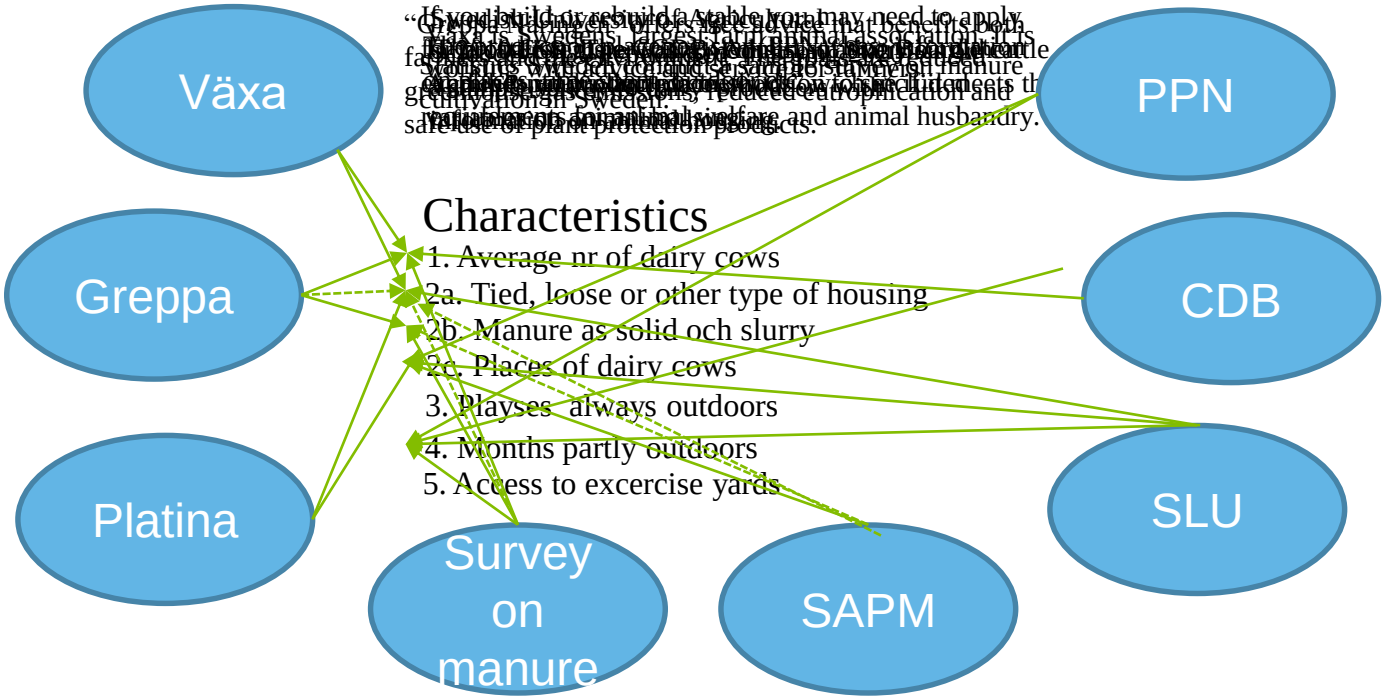
1. Number of places
2. Tied or loose stall
3. Slurry or solid manure

- Months partly outdoors
- Access to excercise yards

Animal Housing

Modelling

Example with dairy cows



Creation of "maximum-file"

FOR the data we had, we created a “maximumfile” to which information from the various registers is linked. One line per company.

The linking was made through those linking variables that we have in Farm register

- Social security number or organisation number to persons/holdings connected to the agricultural holding
- Customer number
- Production place numbers for animals

Create logic

For those data we had we made microdata imputation on each holding.

We had to create some kind of logical solutions for:

- What source to rely on, in different situations
  - Information not consistent from sources
- Different situations/sources have different logical solutions

- Different sources in certain combination gives a full view

- Some situations is incompatible – how to deal with this

Create logic

Idnr	Stable 1- Type	Stable 1 – Manure	Stable 1 – Nr of places	Stable 2 – Type	Stable 2 – Manure	Stable 2 – Nr of places	Stable 3- Type	Stable 3 – Manure	Stable 3 – Nr of places
1	Loose	Solid	45	Tied	Solid	35			
2	Tied	Slurry	300	Loose	Slurry	50	Loose	Solid	30
3			100						
4	Loose		50						
5	Tied	Slurry	500	Loose	Slurry	150	Loose		50
6		Slurry	100		Solid	75			
7	Loose	Solid	35						

”Empty cell” imputed by

- Stratify the population on number of places. For those with missing values put information from other holding in same strata. Different methods depending on type of missing data.

Methods

In practice we have ”invented” a method for each variable. We have used methods like:

- Imputatin from registers
- Used distribution and random in different homogeneous groups
- Strong relationships with other variables
- Used factors from various sources
- Followed legal rules
- Adapted based on regional conditions and rules
- "Consequential effects" of a previous imputation
- Assumptions and some generalizations

Problems

- To understand the area
- Different sources provide different information. How to evaluate the different sources?
- We would like to have access to more sources.
  - It is difficult to explain in advance why/how
  - Legal question marks
- How to judge the quality

Lessons learned

- Extremely knowledge-oriented
- It takes time
- It is always possible to do more
- More preparatory work
  - Maybe asked some questions on the form (e.g. "Other organic and waste-based fertilizers than stable manure used on the farm")