



UNECE



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## INTEGRATION OF ADMINISTRATIVE AND SURVEY DATA TO REDUCE RESPONDENT BURDEN

*The Italian experience in the field of  
agriculture production statistics*



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Istat – Directorate for Data Collection

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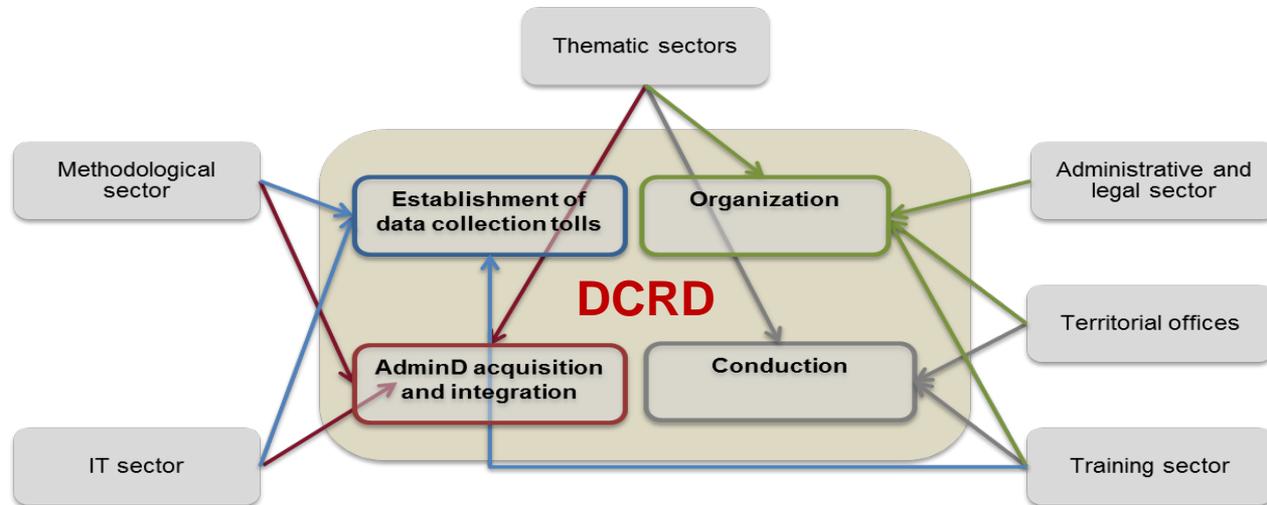
# Towards a new organization of data collection

**Since April 2016** a new organization model has been set up in Istat, which is now based on **Business Architecture Model** (BAM)

BAM has overcome **“silo” approach**. **In the past** each "silo" identified a specific field of statistics (census, social statistics, business statistics) and its corresponding production system

According to the new model, the production process relies on an **integrated organization** and **centralized corporate cross-cutting support services** (technical services, methodology, information technology, data collection, dissemination, ...)

## Data Collection Directorate



- **DCRD centralizes all functions and activities of data collection phase** by managing every single set of data collection process with regard to surveys, administrative data, registers, non-traditional data (Big data).
- **DCRD works in close cooperation with other Istat Directorate/sectors** providing and receiving services

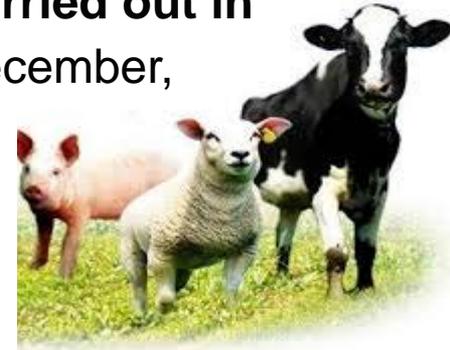
## A project for renewing agriculture statistics



- In the field of agriculture a project has been set up in order to make production of statistics more coherent with Istat modernization guide-lines about **redundancy reduction and data integration**
- The goal is **re-design surveys** and making the **survey process more efficient and less expensive**
- In the data collection process the use of **administrative data is a crucial issue**
- Project is based on **inter-Directorate collaboration**, involving *Directorate for environmental and territorial statistics* in charge of livestock statistics and *Directorate of Data collection* in charge of finding solutions to reduce redundancy of data and response burden

# Livestock statistics in Istat

- Istat carries out **a sample survey twice a year about bovines and pigs** (referring to the 1st of June and the 1st of December)
- Another **sample survey** is carried out **once a year providing statistics on sheep and goats** (referring to the 1st of December)
  - a) Sample units are the **agricultural holdings with animal farms** of one or more animal species
  - b) **Sample units drawn for the December wave of “t” year** (about 9.000 units) **are maintained for the following wave carried out in June of “t+1” year** (follow-up on the respondents of December, involving about 6.000 units)
  - c) Surveys are conducted by **CATI technique**
  - d) Surveys compliant with **Regulation EC1165/2008**





## Bovine register (BR)

- In Italy, in 2002, the Ministry of Health Decree has established the Bovines Register (BR)
- The main aim of the BR is to preserve human and animal health by monitoring bovine meat production and marketing conditions
- A **National Data Bank (NDB)** has been set up in which **all relevant information about different “actors”** mentioned in the BR, need to be recorded (bovines, heard, farmers, etc.).
- In the NDB the following information are registered:
  - each **animal** identified by ear tags;
  - each **event** concerning the animals, within a given time;
  - each **firm** and **herd**;
  - **veterinary service** competent for each firm and heard

# Livestock statistics: modernization and burden reduction



Plan of interventions consists of three main steps:

- 1) **reducing** surveys **sample size** preserving the quality of estimations
- 2) a **progressive shift** of survey technique **from Cati to Cawi**
- 3) the **assessment of quality of administrative data** available at Ministry of Health with the aim of (re)using them to produce statistics on livestock directly

# Can NDB be used for livestock statistics?

Till now NDB has been used **more to compare and validate data estimations** produced by Istat surveys **rather than as a real alternative data source**

A better exploitation of **NDB** could bring important **advantages**:

- (i) avoiding redundancy of information between two “official” sources (Istat and Ministry of Health)
- (ii) making the statistical system more efficient
- (iii) reducing the statistical burden on the respondents
- (iv) reducing costs
- (v) improving the overall quality of the data

# Different use of administrative data

In this perspective, **three different scenarios** using NBD can be identified, with different degrees of **impact on the project of renewing**

- I. The simplest usage of NBD could consist in data exploitation in the survey process as regards data editing/imputation, as far as bovines are concerned → *low impact*
- II. Combining administrative data with sample survey data. A partial substitution of the survey with the administrative source as far as bovines and buffaloes are concerned → *medium impact*
- III. Produce statistical outputs directly from administrative data (with a breakdown of the time series) → *high impact*

## The main steps for assessment of NDB:

1. analyzing metadata in order to understand the relationship between BDN concepts and definitions and those used by Istat
2. studying the quality of information supplied by the NDB (data consistency, timeliness, etc.)
3. making comparison between NDB data and Istat's survey data
4. making operational and sustainable proposals addressed to interventions that allow a better exploitation of NDB for statistical purposes



**A teamwork of experts  
from Istat and Ministry of  
Health**

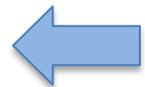
# Which use of NDB for livestock statistics?

Three main issues affect the use of NDB:

- 1) Data need to be pre-treated in order to reconcile the definition of the reference unit, which is different:
  - **reference unit in the survey** = economic unit of agricultural production, including one or more establishment or (open) place where animals are kept and bred → *reference unit (i.e. farm holder) can host more than one herd and be located in more than one place*
  - **reference unit in NDB** = place where a herd is kept and bred → each place can host one or more herds; herds can be owned by different farmers
    - In the same farm can be found different holders
    - If an holder breeds two different herds (eg. bovines and pigs) he/she is counted twice in NDB
- 2) NDB could not be timely updated
  - risk of over-coverage of units, due to farms that have ceased business but are still registered in the database
- 3) Different classifications are used

## About definitions of reference unit...

- Reconciliation of the reference unit is made by using the fiscal code of the owner
- Fiscal code identifies the herd belonging to the same owner but located in different sites (i.e. in different firm, according to NDB)



## About NDB updating...

- In the register, data on livestock are checked and monitored
- farm with no signal of modifying data for long time are identified as suspected to be «ceased»
- By linking the register with other administrative data can be verified if the farm is still active or not



# About classification...

STATISTICAL CLASSIFICATION	ADMINISTRATIVE CLASSIFICATION
<1 year slaughtered like calves	Bovines less than 8 months years old
<1 year breeding males	Bovines males aged from 9 to 12 months
<1 year males for slaughter	Bovines females aged from 9 to 12 months
<1 year breeding females	Bovines males aged from 1 year to less than 2 years
<1 year females for slaughter	Bovines females from 1 year to less than 2 years
1-2 years breeding males	Bovines males aged 2 years and over
1-2 males for slaughter	Heifers (bovines aged 2 years old and over without calves)
1-2 years breeding females	Cows in dairy farms (bovine aged years old with at least one calf)
1-2 years females for slaughter	Cows in other farms (bovine aged 2 years old with at least one calf)
>2 years breeding males	<b>TOTAL CATTLE</b>
>2 years males for slaughter	Foreign origin total bovines (not born in Italy)
>2 years breeding heifers	Buffaloes less than 8 months
>2 years heifers for slaughter	Young male buffaloes aged from 9 to 12 months
>2 years dairy cows	Young female buffaloes aged from 9 to 12 months
>2 years other cows	Male buffaloes aged from 1 year to less than 2 years
<b>TOTAL CATTLE</b>	Female buffaloes aged from 1 year to less than 2 years
<i>Of which from foreign origin</i>	Male buffaloes aged 2 years and over
<1 year slaughtered like calves	Heifers (female buffaloes aged 2 years and over without calves)
<1 year breeding males	Breeding female buffaloes (buffaloes aged 2 years and over with at least a calf)
<1 year males for slaughter	Buffaloes in not dairy breeding (buffaloes aged at least 2 years with at least a calf)
<1 year breeding females	<b>TOTAL BUFFALOES</b>
<1 year females for slaughter	
1-2 years breeding males	
1-2 males for slaughter	
1-2 years breeding females	
1-2 years females for slaughter	
>2 years breeding males	
>2 years males for slaughter	
>2 years breeding heifers	
>2 years heifers for slaughter	
>2 years dairy cows	
>2 years other cows	
<b>TOTAL BUFFALOES</b>	
<i>Of which from foreign origin</i>	

- to reconcile AdmCI and StatCI a «bridge» table has been build-up by using information on production target of the unit (also available in NDB)

# About classification...

STATISTICAL CLASSIFICATION	ADMINISTRATIVE CLASSIFICATION	
<1 year slaughtered like calves	Bovines less than 8 months years old+Bovines males aged from 9 to 12 months+Bovines females aged from 9 to 12 months	for slaughter
<1 year breeding males	Bovines less than 8 months years old+Bovines males aged from 9 to 12 months	for breeding + Semen storage center
<1 year males for slaughter	Bovines less than 8 months years old+Bovines males aged from 9 to 12 months	for meat
<1 year breeding females	Bovines less than 8 months years old+Bovines females aged from 9 to 12 months	dairy + breeding
<1 year females for slaughter	Bovines less than 8 months years old+Bovines females aged from 9 to 12 months	for meat
1-2 years breeding males	Bovines males aged from 1 year to less than 2 years	for breeding + Semen storage center
1-2 males for slaughter	Bovines males aged from 1 year to less than 2 years	for meat + for slaughter
1-2 years breeding females	Bovines females from 1 year to less than 2 years	dairy + breeding
1-2 years females for slaughter	Bovines females from 1 year to less than 2 years	for meat + for slaughter
>2 years breeding males	Bovines males aged 2 years and over	for breeding + Semen storage center
>2 years males for slaughter	Bovines males aged 2 years and over	for meat + for slaughter
>2 years breeding heifers	Heifers (bovines aged 2 years old and over without calves)	dairy + breeding
>2 years heifers for slaughter	Heifers (bovines aged 2 years old and over without calves)	for meat + for slaughter
>2 years dairy cows	Cows in dairy farms (bovine aged years old with at least one calf)	dairy + breeding
>2 years other cows	Cows in other farms (bovine aged 2 years old with at least one calf)	for meat + for slaughter
<b>TOTAL CATTLE</b>	<b>TOTAL CATTLE</b>	all the items
<i>Of which from foreign origin</i>	Foreign origin total bovines (not born in Italy)	all the items

## Use of NDB for livestock statistics

Bovine. Istat statistics and NDB data, by age – June 2016

	ISTAT	NDB	%
total < 1 years	1.652.514	1.757.255	-6,0
males 1-2 years	529.560	492.709	7,5
females 1-2 years	918.190	883.711	3,9
total 1-2 years	1.447.750	1.376.420	5,2
males >2 years	78.855	67.713	16,5
females >2 years	2.613.709	2.579.862	1,3
total >2 years	2.692.564	2.647.575	1,7
Bovine	5.792.828	5.781.250	0,2

Buffaloes. Istat statistics and NDB data, by age – June 2016

	ISTAT	NDB	%
total < 1 years	49.635	54.546	-9,0
males 1-2 years	7.260	7.095	2,3
females 1-2 years	47.094	40.165	17,3
total 1-2 years	54.354	47.260	15,0
males >2 years	8.263	12.508	-33,9
females >2 years	278.098	274.574	1,3
total >2 years	286.361	287.082	-0,3
Buffaloes	390.350	388.888	0,4

Ex-post comparison between Istat and NDB classification show that:

- the total number of bovine and buffaloes livestock have a high degree of comparability. The differences between the two sources are 0,2% for bovine and 0,4% for buffaloes
- Both for cattles and buffaloes data are less consistent at level of animal age;
- important differences exists for some categories

The bridge table could be sharpened by using additional information – such as the race (not only cattle but also pigs, sheeps) and the precise age of the animal- which are into NDB but not yet available



## Final remarks

- Results suggest that the use of NDB in place of Istat surveys could be a possible way for producing statistics on livestock, containing the statistical burden
- To build up a more accurate “bridge” table, using further information
- A condition for adopting NDB for statistical purposes is that the quality of the statistics obtained can not be lower than those obtained by ad hoc surveys
- Transition from survey to NDB-based statistics requires an increase of coverage
- Last but not least, a strong cooperation between Istat and Ministry of Health is needed
- Practice in this field confirmed importance to find solution ex-ante, before administrative database is implemented

Questions and  
suggestions are  
welcome



**Thank you**

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