



جامعة الدول العربية  
المنظمة العربية للتنمية الزراعية

# الندوة القومية لاحصاءات الثروة الحيوانية

PLACE OF AGRICULTURAL CENSUS  
AMONG VARIOUS DATA SOURCES  
ON  
LIVESTOCK AND LIVESTOCK PRODUCTS  
BY  
O.Z. AVRALIOGLU

الخرطوم: ٦٠٥ مايو (ايار) ١٩٩١

**PLACE OF AGRICULTURAL CENSUS  
AMONG VARIOUS DATA SOURCES ON  
LIVESTOCK AND LIVESTOCK PRODUCTS**

**(Paper presented at the Symposium on Livestock Statistics held  
in Khartoum during 4-5 May 1991)**

**STATISTICS DIVISION  
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

## CONTENTS

	Page
<b>DATA NEEDED</b> .....	1
<b>Introduction</b> .....	1
<b>Classification of items</b> .....	2
<b>Periodicity of data collection</b> .....	7
<b>AGRICULTURAL CENSUS</b> .....	8
<b>World Census of Agriculture (WCA) Programmes</b> .....	8
<b>Main items on livestock in WCA Programmes</b> .....	8
<b>Country practices in 1980 WCA</b> .....	13
<b>OTHER SOURCES OF DATA</b> .....	32
<b>Livestock census</b> .....	32
<b>Sample surveys on specific subjects</b> .....	32
<b>Administrative records</b> .....	34
<b>Experimental research</b> .....	35
<b>SUGGESTIONS</b> .....	36
<b>Methodology</b> .....	36
<b>Scope</b> .....	36

1. DATA NEEDED

1.1 Introduction

1.1.1 Livestock occupies an important place in the agricultural sector of majority of countries. In many countries mixed farming of crop production and livestock husbandry continues to be the predominant practice while in some countries specialized livestock farms are increasing in number. Adequate analysis of livestock husbandry as an integral part of overall economic planning, requires various types of summarized data, which include total numbers of livestock by sex, age and use, index numbers for livestock production, indicators of input-output relations, imports and exports of live animals and livestock products, consumption of livestock products, food and feed balance sheets, indicators of self sufficiency in livestock products, economic accounts, prices at various levels, stocks and livestock herd models.

1.1.2 A few of the relevant indicators are given below:

$$(a) \text{ Offspring rate} = \frac{\text{animals born alive}}{\text{breeding female}}$$

This is the number of live births per breeding female in a given reference period.

$$(b) \text{ Age specific death rate} = \frac{\text{number of deaths in a given age class in a given year}}{\text{mid-year population in the given age group}}$$

This death rate shows the percentage of animals dying (slaughtering excluded) in a given age class during a year.

$$(c) \text{ Offtake rate} = \frac{\text{indigenous slaughterings + exports of live animals}}{\text{beginning stock}}$$

This rate is an indication of the turnover of the stock in a reference period. For example, it is very high for poultry.

$$(d) \text{ Meat yield} = \frac{\text{meat produced}}{\text{number slaughtered}}$$

This is the average quantity of meat produced per slaughtered livestock.

$$(e) \text{ Milk yield} = \frac{\text{milk produced}}{\text{number of milked animals}}$$

This yield shows the average quantity of milk obtained per animal milked in a given reference period.

1.1.3 Herd model refers to the composition of the herd for each type of livestock. Particularly the change in the herd composition over a period of time is relevant for evaluating the future feed requirements and productivity of livestock population. To construct a herd model birth rate, age, sex and use classification of livestock, and for each class death rates and slaughter rates need to be known.

1.1.4 Special mention should be made of the Supply Utilization Accounts (SUA) that provide integrated presentation of data on production, trade, stocks and use. For each product in a country, SUA traces its supplies from production, imports and stocks to its utilization in different forms. Besides being useful for making commodity projections, SUA is helpful in detecting inconsistencies between data coming from different sources. It distinguishes primary commodities from processed commodities. Livestock is one of the primary commodities. In the case of livestock numbers SUA is based on the following equation:

$$\text{Number at the beginning of a period} + \text{births} + \text{imports} - \text{exports} - \text{deaths} - \text{slaughterings} = \text{Number at the end of the period}$$

The number of livestock need to be classified by age and sex, in order to be able to calculate offspring rate and other useful indicators. SUA covers primary products from live animals such as eggs and milk; and processed products of slaughterings in addition to livestock numbers. For these primary or processed commodities the supply and the utilization are:

$$\text{Supply} = \text{Production} + \text{imports} + \text{from stocks}$$

$$\text{Utilization} = \text{To stocks} + \text{exports} + \text{feed} + \text{hatching (eggs)} + \text{waste} \\ + \text{processing} + \text{direct food consumption} + \text{other}$$

## 1.2 Classification of items

1.2.1 FAO has published a volume in the Statistical Development Series with the title "Food and Agricultural Statistics in the Context of a National Information System". The purpose of the volume is to provide the countries with the recommendations for preparing a long-term statistical data collection programme on food and agriculture which includes various censuses and surveys as well as administrative records and other sources. In order to make concrete recommendations the document gives a long list of items on which data should be collected. It also indicates alternative data sources for each item. The items are

grouped into 17 categories, each category being sub-divided into Divisions, Sections and Subsections, in descending order, before reaching at the "item". Each item has a code number consisting of six digits. The first two digits refer to the category, the third digit to the division, the fourth digit to the section, the fifth digit to the subsection and the sixth digit to the item. The list of items is meant to serve as a starting point for discussions in each country where some additions to and deletions from it would naturally be necessary.

The categories of items are as follows:

- 01 Identification
- 02 General characteristics
- 03 Demographic characteristics
- 04 Employment
- 05 Land and water
- 06 Crops
- 07-08 Livestock
- 09 Machinery and equipment
- 10 Buildings and other structures
- 11 Ancillary activities
- 12 Credit, marketing, stocks
- 13 Prices
- 14 Post-harvest losses
- 15 Income and outlay
- 16-17 Other

The reason for allocating both categories 07 and 08 to livestock is that the number of items is too many to be covered in one category only. In the last category (other) the following divisions are included:

- Foreign trade of agricultural inputs and products
- National accounts and budget
- Government land and water development and crop improvement projects
- Government-held stocks of agricultural products
- Domestic manufacturing
- Climatic data
- Community services available at village level
- Technological research
- Quality of irrigation water
- Soil characteristics
- Agricultural extension
- Agricultural education
- Miscellaneous (legal cases, food composition, etc.)

1.2.2 When studying a given subject matter in the domain of food and agriculture, various categories need to be consulted in order to have a complete coverage of all relevant aspects. Each category can contribute data regarding a particular aspect of a given subject. The case of livestock is explained here:

1.2.3 Some items from Category 01 are needed to identify the economic unit carrying out livestock husbandry. Category 02 contains items regarding legal status of the economic unit and its involvement in

other economic activities in addition to livestock husbandry. Category 04 provides data on labour. Category 05 as on data regarding land and water which are important inputs for livestock husbandry. Crops grown for feed are covered in Category 06. Categories 07 and 08 cover aspects of livestock husbandry that are most directly related to animals. The following are the divisions within these categories.

- 071 Management and population (livestock production system, animal numbers)
- 072 Cattle
- 073 Buffaloes
- 074 Sheep
- 075 Goats
- 076 Pigs
- 077 Horses and camels
- 078 Chickens
- 079 Other poultry (ducks, geese, etc.)
- 081 Other domesticated animals (bees, deer, etc.)

Except the division 071, each division is dedicated to a particular type of livestock. The structures of the divisions on types of livestock are similar to each other. Therefore after presenting the division 071, the division 072 is given below as an example for the divisions on types of livestock.

- 071 Management and population
- 0711 Livestock production system
- 071101 Type of production system
  - (a) Nomadic or totally pastoral
  - (b) Semi-nomadic or semi-pastoral
  - (c) Sedentary pastoral
  - (d) Ranching
- 0712-0713 Animal numbers, by type of animal
- 071201 Cattle
- 071202 Buffaloes
- 071203 Sheep
- 071204 Goats
- 071205 Pigs
- 071206 Horses
- 071207 Asses
- 071208 Mules and hinnies
- 071209 Camels
- 071301 Chickens
- 071302 Beehives
- 071303 Deer
- 071304 Others (e.g. other poultry, rabbits, llamas, elephants, ostriches, silkworms, fur-bearing animals reared in captivity, etc.)

1.2.4 The following definitions are proposed for types of production systems:

- (a) Nomadic or totally pastoral: livestock kept by households with no permanent place of residence and do not practise regular cultivation;

(b) Semi-nomadic or semi-pastoral: livestock kept by households that establish permanent residence for several years. These households cultivate crops as a supplementary food source, but move herds on transhumance to assure forage and water;

(c) Sedentary pastoral: livestock keeping and crop cultivation are carried out by households with permanent residence;

(d) Ranching: livestock kept on ranches.

The items of the division 072 are as follows:

- 072 Cattle
  - 0721 Herd structure and management
    - 07211 Cattle population, by age, sex and main purpose
      - 072111 Present population
        - Age classes:
          - (1) Under 1 year of age
          - (2) 1 year of age and under two years
          - (3) 3 years of age and over
        - Main purpose classes:
          - (1) For breeding
          - (2) For draught
          - (3) For milk
          - (4) For meat
      - 072112 Maximum population
      - 072113 Minimum population
      - 07212 Sales and purchases during year
        - 072121 Number of cattle sold, by age, sex and main purpose
        - 072122 Total value of sales
        - 072123 Number of cattle purchased, by age, sex and main purpose
        - 072124 Total cost of purchases
      - 07213 Births and deaths during year
        - 072131 Number of live births, by sex
        - 072132 Number of natural deaths, by age, sex and main purpose
      - 07214 Breed
        - 072141 Present population of cattle, by race
      - 07215 Weight
        - 072151 Present population of cattle, by weight class:
          - (1) Less than 225 kg.
          - (2) 225 kg. and over
    - 0722 Veterinary services
      - 072201 Number of presently diseased cattle, by type of disease
      - 072202 Number of sick cattle treated during year
      - 072203 Number of cattle vaccinated during year, by type of vaccine
      - 072204 Cost of veterinary services during year
    - 0723 Feed
      - 072301 Quantity consumed, type
      - 072302 Cost of feed
    - 0724 Labour
      - 072401 Unpaid household members' time
      - 072402 Other workers' time
    - 0725 Other inputs
      - 072501 Other inputs (to be specified)



072502	Cost of other inputs
0726	Production - meat
072601	Number slaughtered by household during year, by age, sex and purpose
072602	Liveweight of cattle slaughtered by household during year
072603	Number slaughtered at slaughterhouses during year, by origin (indigenous, foreign)
072604	Liveweight of cattle slaughtered at slaughterhouses during year
072605	Carcass weight of cattle slaughtered at slaughterhouses during year
072606	Value of cattle slaughtered at slaughterhouses during year
0727	Production - milk
07271	Milk products
072711	Quantity of milk produced
072712	Value of milk produced
072713	Quantity of milk used for milk products
07272	Milk products
072721	Quantity of butter produced
072722	Quantity of cheese produced
072723	Quantity of yoghurt produced
072724	Quantity of other milk products produced (to be specified)
072725	Value of milk products produced
0728	Production - other
072801	Number of hides
072802	Other (to be specified)
072803	Value of other cattle products produced

As it can be noted the emphasis in the categories 07-08 is on the inputs and outputs of livestock husbandry.

1.2.5 Category 10 contains items on agricultural buildings, including those used for keeping livestock: Area and volume of buildings, construction materials, tenure of buildings, sales and purchases of buildings.

1.2.6 In Category 12 credit, marketing and stocks are covered. These topics are relevant to both crops cultivation and livestock husbandry: sources of credit, terms of credit, use of credit, source of inputs, uses of production, buyers of products, location of sales, stocks at the beginning and at the end of the year for both inputs and commodities produced. One of the most important topics is the price which is covered in Category 13. This category itemizes all types of prices from prices received by farmer to world prices for agricultural commodities as well as prices of inputs. Category 15 is on the income and outlay. Services rendered to others or services obtained from others for livestock production are itemized in this category. In the last category (category 16-17) foreign trade of inputs and products, manufacturing of livestock products, climatic data, agricultural accounts, extension services are itemized.

### 1.3 Periodicity of data collection

1.3.1 Not all characteristics relevant to animal husbandry and livestock products change at the same rate. Some characteristics change slowly while some others change rapidly. Periodicity of data collection activities should be so planned that available data should provide an upto date picture of the situation at minimal cost. It would not be justifiable to embark on a monthly survey on buildings used for livestock, because this is not a subject which changes from month to month. But it is recommendable to follow the world prices of livestock products on a daily basis; because prices may change rapidly.

1.3.2 In delineating the scope of data collection activities it is advisable to devote the items that change approximately at the same rate to the same data collection activity. This is one of the basic principles which must be observed in deciding the contents of the questionnaires of various censuses and surveys.

1.3.3 In the division 072 that is itemized above, there are three different populations referring to the total number of cattle:

072111 Present population  
072112 Maximum population  
072113 Minimum population

The present population refers to the number of cattle at a given date. Maximum population is the number right after the breeding period. Minimum population would be the number preceding the breeding season.

The difference between these numbers may be quite significant. There are two factors which cause sharp change in livestock (particularly sheep) numbers. The first is the muslim festival during which livestock is sacrificed. It should be noted that the time of this festival changes every year. Thus, it is not possible to associate this decrease to any specific season. The second factor is the movement of nomads over the national boundries.

## 2. AGRICULTURAL CENSUS

### 2.1 World Census of Agriculture (WCA) Programmes

2.1.1 Since 1930, all countries of the world have been invited to participate in the decennial world census of agriculture programmes. The programme was first initiated by the International Institute of Agriculture (IIA) in 1930. 53 countries and territories participated in that programme. Although IIA tried to sponsor a similar Programme in 1940, due to second world war, many countries did not conduct any censuses during that period. After the second world war, the responsibilities of IIA were taken over by FAO. Thus FAO, starting with 1950 has been sponsoring a world census of agriculture programme every 10 years. The number of countries and territories that participated in these programmes are 81 in 1950, 100 in 1960, 111 in 1970 and 103 in 1980. At the present time 1990 World Census of Agriculture is underway.

2.1.2 The 1930 Programme was implemented when there was a great lack of data on agriculture and data sources were not well organized. Consequently, agricultural census programme was planned with a large scope to provide all data needed. Emphasis was put on the production data. However, at the implementation stage, many countries experienced difficulties in executing an agricultural census with a large scope. Since 1950 the emphasis in agricultural census programmes has shifted from production data to structural variables.

2.1.3 Agricultural censuses are in fact censuses of agricultural holdings. As such they collect data on livestock kept in agricultural holdings. If the census of agriculture introduces a minimum size criteria (based on area and/or number of animals) on holdings to be included by the census, then small holdings and their livestock are not covered. The exclusion may result in serious undercount of livestock in an agricultural census, if there are too many holdings below the minimum size limit.

### 2.2 Main items on livestock in WCA Programmes

2.2.1 The WCA Programmes have always proposed two sets of items: the first set, which is called the "main items" refers to the subjects considered as the most important subjects. The second set of items covers other desirable topics. The following table shows the main items on livestock recommended in various WCA Programmes.



MAIN ITEMS RELATED TO LIVESTOCK AND LIVESTOCK PRODUCTION IN CENSUS PROGRAMMES

Main Item	1930	1940	1950	1960	1970	1980	1990
(e) Heifers in calf and cows .....			X				
(f) Buffaloes 3 years and over, primarily for draught work .....				X	X		
3. Sheep .....							X
- Lambs under 1 year .....				X	X	X	
- Sheep 1 year and over .....	X	X	X	X	X	X	
- male .....	X	X	X	X	X	X	
- female .....	X	X	X	X	X	X	
4. Goats .....							X
- Goats under 1 year .....				X	X	X	
- Goats 1 year and over .....				X	X	X	
5. Pigs .....							X
(a) Under 6 months .....	X	X	X	X	X	X	
(b) 6 months and over .....							X
- sows and gilts for breeding .....			X	X	X		
sows .....	X	X					
gilts .....	X	X					
others .....	X	X					
6. Horses .....							X
(a) Under 3 years .....			X				
- Under 1 year .....	X	X					
- 1 year and under 3 years .....	X	X					
(b) 3 years and over .....			X				
- uncastrated male .....	X	X					
- other .....	X	X					
Castrated male .....	X	X					
Female .....	X	X					
7. Mules .....			X	X	X	X	X
- Under 2 years .....	X	X					
- 2 and more years .....	X	X					

MAIN ITEMS RELATED TO LIVESTOCK AND LIVESTOCK PRODUCTION IN CENSUS PROGRAMMES

Main Item	1930	1940	1950	1960	1970	1980	1990
8. Asses .....	X	X	X	X	X	X	X
9. Poultry .....	X	X	X	X	X	X	X
- Hens, cocks, pullets and chicks .....	X	X	X	X	X	X	X
- Ducks and ducklings .....	X	X	X	X	X	X	X
- Geese and goslings .....	X	X	X	X	X	X	X
- Turkeys and poults .....	X	X	X	X	X	X	X
- Pigeons .....	X	X	X	X	X	X	X
10. Beehives and colonies .....	X	X	X	X	X	X	X

**LIVESTOCK PRODUCTION**

1. Dairy Products:	
(a) Milk	
- from cows .....	X
- from other animals .....	X
(b) Butter .....	X
(c) Cheese .....	X
2. Egg production .....	X
3. Number of sheep shorn .....	X
4. Quantity of wool obtained .....	X
5. Quantity of mohair obtained .....	X
6. Honey produced .....	X
7. Quantity of silkworm eggs prepared for incubation ..	X
8. Quantity of fresh cocoons produced .....	X

MAIN ITEMS RELATED TO LIVESTOCK AND LIVESTOCK PRODUCTION IN CENSUS PROGRAMMES

Main Item	1930	1940	1950	1960	1970	1980	1990
<b><u>POWER</u></b>							
Indication of the power used							
- mechanical power .....			x	x	x		
- animal power .....			x	x	x		
- human power .....							x
<b><u>MACHINERY</u></b>							
Threshing equipment							
- Hand operated .....							x
- Animal operated .....							x
- Engine operated .....				x	x	x	
Milking machinery and equipment							
- Milking machines .....							x

2.2.2 It can be noted that in the 1930 and 1940 WCAs attention was focused not only on the number and characteristics of livestock, but also on livestock production. Regarding livestock numbers sex and age distributions were taken into account. For cattle, pigs and horses data on purpose were also collected. The livestock products covered, included milk, butter, cheese, egg, wool, mohair, honey, silkworm eggs and fresh cocoons. It is also noted that 1930 and 1940 programmes did not include buffaloes among the main items. Starting with 1950, the list of main items excluded all livestock production, buffaloes were introduced as a main item, sex and use distributions of horses were left outside of main items. Sex and age distributions of cattle and buffaloes were main items in 1950, 1960 and 1970 WCA Programmes. In 1980 WCA only age distribution was retained as the main item in addition to total numbers. In 1990 WCA only total numbers are considered as main items. Sex, age, use distributions are all left outside of main item list.

2.2.3 The trend of diminishing numbers of main items regarding livestock in WCA Programmes has always been justified with the need to carry out separate censuses or surveys on livestock. It is emphasized that a census of agriculture should concentrate on slowly changing aspects of agriculture rather than covering detailed topics which may change in short periods of time.

### 2.3 Country practices in 1980 WCA

2.3.1 In the Programme for the 1980 WCA, FAO received the results of national agricultural censuses from 78 countries. All of these 78 countries included some items on livestock in their agricultural census. The following table shows the numbers of countries by region and by section of 1980 Programme on which they asked questions in their census.

Number of countries by region and by section of 1980 Programme in which they participated

Section	Region						Total
	Africa	Asia and the Pacific	Europe	Latin Am. and the Caribbean	Near East	North Amer.	
Holding	14	16	21	17	8	2	78
Holder	14	16	20	17	8	2	77
Pop. and Empl.	14	15	20	16	8	2	75
Land use	5	15	20	17	8	2	67
Crops	13	16	20	17	8	2	76
Livestock	14	16	21	17	8	2	78
Machinery	12	14	19	15	8	2	70
Selected Practices	9	12	10	15	8	2	56



2.3.2 The types of livestock and the number of characteristics of livestock that are covered in the census vary from country to country. The following tables show the data collected on livestock by each country.

Data collected by countries on certain types  
of livestock: cattle and buffaloes

Region and Country	Livestock							
	Cattle				Buffaloes			
	Total	Age	Sex	Purpose	Total	Age	Sex	Purpose
<b>AFRICA</b>								
Botswana	X	X	X					
Cape Verde	X							
Central Afr. Rep.	X							
Congo	X							
Ethiopia	X	X	X	X				
Kenya	X	X	X					
Madagascar	X		X					
Malawi	X	X	X					
Mauritania	X							
Niger	X							
Reunion	X		X					
Rwanda	X	X						
Sierra Leone	X		X					
Togo	X		X					
<b>ASIA AND THE PACIFIC</b>								
American Samoa	X			X				
Australia	X	X	X	X				
Bangladesh	X	X	X	X	X	X	X	X
Fiji	X	X	X					
Guam	X			X	X			
India	X	X	X		X	X	X	
Japan	X				X			
Korea, Republic of	X	X	X					
Nepal	X	X	X	X	X	X	X	X
New Zealand	X	X	X	X				
Northern Mariana Is.	X			X	X			
Pakistan	X	X	X	X	X	X	X	X
Philippines	X	X	X	X				
Sri Lanka	X	X	X	X	X	X	X	X
Thailand	X	X	X	X	X	X	X	X
Tonga	X	X	X	X				

Data collected by countries on certain types  
of livestock: cattle and buffaloes

Region and Country	Livestock							
	Cattle				Buffaloes			
	Total	Age	Sex	Purpose	Total	Age	Sex	Purpose
<b>EUROPE</b>								
Austria	X	X	X					
Belgium	X	X	X					
Czechoslovakia	X	X	X					
Denmark	X	X	X	X				
Finland	X	X	X	X				
France	X	X	X	X				
Germany, Fed. Rep.	X	X	X	X				
Hungary	X		X		X	X	X	
Ireland	X	X	X	X				
Italy	X	X	X	X				
Luxembourg	X	X	X	X				
Malta	X	X	X					
Netherlands	X	X	X	X				
Norway	X	X	X					
Poland	X	X	X	X				
Portugal	X	X	X	X				
Spain	X	X	X	X				
Sweden	X	X	X	X				
Switzerland	X	X	X					
United Kingdom	X	X	X	X				
Yugoslavia	X	X	X					
<b>LATIN AMERICA AND THE CARIBBEAN</b>								
Antigua and Barbuda	X		X					
Bahamas	X	X	X					
Belize	X	X	X					
Brazil	X	X	X		X		X	
French Guiana	X		X					
Grenada								
Guadeloupe	X							
Guatemala	X	X	X					
Jamaica	X		X					

Data collected by countries on certain types of livestock: cattle and buffaloes

Region and Country	Livestock							
	Cattle				Buffaloes			
	Total	Age	Sex	Purpose	Total	Age	Sex	Purpose
<b>LATIN AMERICA AND THE CARIBBEAN (cont.)</b>								
Martinique	X	X						
Panama	X	X	X	X				
Paraguay	X	X	X	X				
Puerto Rico	X		X	X				
Suriname	X		X		X		X	
Trinidad and Tobago	X		X	X	X	X		
Uruguay	X	X	X	X				
Virgin Islands (US)	X	X	X					
<b>NEAR EAST</b>								
Bahrain	X	X	X	X				
Cyprus	X	X	X	X				
Israel	X		X					
Jordan	X	X	X					
Oman	X	X	X					
Saudi Arabia, K. of	X	X						
Turkey	X	X	X		X	X	X	
Yemen Arab Republic	X	X	X					
<b>NORTH AMERICA</b>								
Canada	X	X	X	X				
United States	X		X	X				

Data collected by countries on certain types of livestock: sheep, goats, pigs, horses, mules, asses, camels, bees and rabbits

Region and Country	Livestock																
	Sheep			Goats			Pigs			Horses		Mules	Asses	Camels		Bee Hives	Rabbits
	Total	Age	Sex	Total	Age	Sex	Total	Age	Sex	Total	Age			Total	Age		
<b>AFRICA</b>																	
Botswana	X	X	X	X	X	X				X			X				
Cape Verde				X						X							
Central Afr. Rep.	X			X												X	
Congo	X			X													
Ethiopia	X	X	X	X	X	X				X	X	X	X	X	X		
Kenya	X	X		X	X		X	X					X				
Madagascar	X			X			X	X	X	X			X			X	X
Malawi	X			X			X						X				
Mauritania	X			X			X			X				X			
Niger	X			X						X			X	X			X
Reunion	X			X			X			X			X			X	X
Rwanda	X	X	X	X	X	X	X	X	X								
Sierra Leone	X			X												X	
Togo	X			X			X			X			X			X	
<b>ASIA AND THE PACIFIC</b>																	
American Samoa							X				X						
Australia	X	X	X	X			X			X	X						
Bangladesh	X			X													
Fiji				X	X	X	X			X							
Guam				X			X			X							
India	X	X		X	X		X	X		X	X	X	X	X	X		
Japan				X			X			X							
Korea, Rep. of	X			X			X	X		X						X	X
Nepal	X	X	X	X	X	X	X	X			X						
New Zealand	X		X	X			X	X		X	X						X
Northern Mariana Is.				X			X						X				
Pakistan	X	X	X	X	X	X				X		X	X	X	X		
Philippines				X	X	X	X	X		X	X	X					X
Sri Lanka	X	X		X	X		X	X									
Thailand	X			X			X										
Tonga				X						X	X						

Data collected by countries on certain types of livestock: sheep, goats, pigs, horses, mules, asses, camels, bees and rabbits

Region and Country	Livestock																
	Sheep			Goats			Pigs			Horses		Mules	Asses	Camels		Bee Hives	Rabbits
	Total	Age	Sex	Total	Age	Sex	Total	Age	Sex	Total	Age			Total	Age		
<b>EUROPE</b>																	
Austria	X			X			X	X	X	X							
Belgium	X		X	X			X			X	X	X				X	X
Czechoslovakia	X	X		X			X	X	X	X							
Denmark	X						X			X	X						
Finland	X	X					X	X	X	X							
France	X	X	X	X			X		X	X		X				X	X
Germany, Fed. Rep. of	X	X	X	X		X	X		X	X						X	
Hungary	X			X												X	
Ireland	X	X	X	X			X		X	X		X					
Italy	X			X			X			X		X				X	X
Luxembourg	X	X	X	X			X		X	X	X						X
Malta	X	X	X	X	X	X											X
Netherlands	X	X	X	X	X	X	X		X	X	X						
Norway	X	X		X	X		X	X		X	X					X	X
Poland	X	X	X				X	X		X							
Portugal	X	X	X	X	X	X	X	X	X	X		X	X			X	X
Spain	X	X	X	X	X	X	X		X	X		X	X			X	X
Sweden	X	X					X	X		X	X						
Switzerland	X	X	X	X	X	X	X	X		X		X				X	X
United Kingdom	X	X	X				X		X	X							
Yugoslavia	X	X					X	X		X						X	
<b>LATIN AMERICA AND THE CARIBBEAN</b>																	
Antigua and Barbuda	X			X			X										
Bahamas	X			X			X										
Belize	X	X		X			X			X		X	X			X	
Brazil	X	X	X	X	X	X	X	X	X	X	X	X	X			X	
French Guiana	X			X			X			X		X				X	X
Grenada																	
Guadeloupe	X			X			X			X		X				X	X
Guatemala	X	X		X			X	X	X	X		X				X	X
Jamaica	X			X			X		X			X				X	X

Data collected by countries on certain types of livestock: sheep, goats, pigs, horses, mules, asses, camels, bees and rabbits

Region and Country	Livestock																
	Sheep			Goats			Pigs			Horses		Mules	Asses	Camels		Bee Hives	Rabbits
	Total	Age	Sex	Total	Age	Sex	Total	Age	Sex	Total	Age			Total	Age		
<b>LATIN AMERICA AND THE CARIBBEAN (cont.)</b>																	
Martinique	X			X			X			X			X			X	X
Panama							X			X			X				
Paraguay	X	X	X				X	X	X	X	X	X	X	X		X	
Puerto Rico				X			X	X	X	X			X			X	X
Suriname	X			X			X										
Trinidad and Tobago	X			X			X			X		X	X			X	
Uruguay	X			X			X	X			X					X	X
Virgin Islands (US)	X			X			X	X		X			X				
<b>NEAR EAST</b>																	
Bahrain	X	X		X	X	X	X			X			X	X			
Cyprus	X	X		X	X	X	X	X	X							X	X
Israel	X	X		X	X	X	X	X	X		X		X			X	
Jordan	X	X		X	X	X	X			X		X	X	X		X	
Oman	X	X		X	X					X			X	X		X	
Saudi Arabia, K. of	X	X		X	X					X	X			X	X		
Turkey	X	X		X	X	X	X										
Yemen Arab Republic	X	X		X	X	X	X						X	X			
<b>NORTH AMERICA</b>																	
Canada	X	X					X			X						X	X
United States	X	X		X	X		X			X			X			X	X

Data collected by countries on certain types of livestock: poultry, turkeys, other birds, llamas, alpacas and fur-bearing animals

Region and Country	Poultry			Turkeys	Other birds	Llamas	alpacas	Fur-bearing animals
	Total	Age	Use					
<b>AFRICA</b>								
Botswana	X				X			
Cape Verde								
Central Afr. Rep.	X				X			
Congo	X							
Ethiopia	X	X		X	X			
Kenya	X							
Madagascar	X			X	X			
Malawi	X				X			
Mauritania	X							
Niger	X				X			
Reunion	X		X		X			
Rwanda								
Sierra Leone	X		X		X			
Togo	X				X			
<b>ASIA AND THE PACIFIC</b>								
American Samoa	X				X			
Australia	X		X	X	X			
Bangladesh	X				X			
Fiji	X		X		X			
Guam	X	X	X		X			
India	X	X	X		X			
Japan	X	X	X					
Korea, Rep. of	X	X	X	X	X			
Nepal	X	X			X			
New Zealand	X		X	X	X			
Northern Mariana Is.	X				X			
Pakistan	X		X		X			
Philippines	X	X	X	X	X			
Sri Lanka	X	X	X	X	X			
Thailand	X		X		X			
Tonga	X	X			X			



Data collected by countries on certain types of livestock: poultry, turkeys, other birds, llamas, alpacas and fur-bearing animals

Region and Country	Poultry			Turkeys	Other birds	Llamas	alpacas	Fur-bearing animals
	Total	Age	Use					
<b>EUROPE</b>								
Austria	X				X			
Belgium	X	X	X	X	X			
Czechoslovakia	X		X	X	X			
Denmark	X	X	X	X	X			
Finland	X	X						
France	X	X	X	X	X			X
Germany, Fed. Rep. of	X	X	X	X	X			
Hungary	X	X	X					
Ireland	X	X	X	X	X			
Italy	X		X		X			X
Luxembourg	X	X	X	X	X			
Malta	X	X	X	X	X			
Netherlands	X	X	X	X	X			
Norway	X	X	X	X	X			X
Poland	X	X						
Portugal	X	X	X	X	X			
Spain	X	X	X		X			
Sweden	X	X	X					
Switzerland	X	X	X		X			
United Kingdom	X	X	X	X	X			
Yugoslavia	X							
<b>LATIN AMERICA AND THE CARIBBEAN</b>								
Antigua and Barbuda								
Bahamas	X		X	X	X			
Belize	X		X	X	X			
Brazil	X	X	X		X			
French Guiana	X		X		X			
Grenada								
Guadeloupe	X		X		X			
Guatemala	X	X	X		X			
Jamaica	X		X	X	X			

Data collected by countries on certain types of livestock: poultry, turkeys, other birds, llamas, alpacas and fur-bearing animals

Region and Country	Poultry			Turkeys	Other birds	Llamas	Alpacas	Fur-bearing animals
	Total	Age	Use					
<b>LATIN AMERICA AND THE CARIBBEAN (cont.)</b>								
Martinique	X		X		X			
Panama	X	X	X		X			
Paraguay	X		X		X			
Puerto Rico	X	X	X		X			
Suriname	X		X					
Trinidad and Tobago	X		X	X	X			
Uruguay	X		X		X			
Virgin Islands (US)	X	X			X			
<b>NEAR EAST</b>								
Bahrain	X	X	X		X			
Cyprus	X	X	X	X	X			
Israel	X	X	X	X	X			
Jordan	X	X		X	X			
Oman	X							
Saudi Arabia, K. of	X							
Turkey								
Yemen Arab Republic								
<b>NORTH AMERICA</b>								
Canada	X	X	X	X	X			X
United States	X	X	X	X	X			X

2.3.3 The following table summarizes the country level data presented in the previous table. It is noted that in the Near East Region the purpose of cattle, age of horses, age of camels, number of buffaloes, mules, and rabbits were not asked in many countries. However, sex and age data on sheep and goats are collected mainly by the countries in the Near East. Some countries in Europe and Asia and the Pacific have also included these items in their census. In general, more attention is paid to report the number of breeding female stock in many countries of the world. For example in Spain, the following data are collected on sheep and goats:

- Number of mothers
- Number of young females (that will replace mothers)
- Others.

2.3.4 Regarding horses, mules and donkeys some countries (e.g., Japan, Turkey) did not collect any data. A few countries (American Samoa, Israel, Northern Mariana Islands, Uruguay) collected data on total numbers of these three species taken together. Another group of countries put mules and asses in the same group: Botswana, Belgium, France, Ireland, Italy, Reunion, Switzerland, French Guiana, Guadeloupe, Guatemala, Jamaica, Martinique, Panama, Puerto Rico, Virgin Islands (US), United States. In Nepal horses and mules were put in the same class. The majority of countries did not collect age data on horses. In some countries different characteristics of horses were used to classify them. The items on horses in some of these countries are given below:

- |                |   |
|----------------|---|
| United Kingdom | (a) Agricultural horses of all types and ages<br>(b) All other horses and ponies<br>- used for breeding<br>- others |
| Puerto Rico:   | (a) Race and show horses<br>(b) Other horses  |
| Switzerland:   | (a) Horses used for agricultural work<br>(b) Horses used for non-agricultural work<br>(c) Horses not yet used       |

In some countries the age of horses and their use were used to classify them. For example, in Belgium the following items are included in the census:

- (a) Agricultural horses
  - less than 3 years of age
  - 3 years old or older
- (b) Other horses
  - less than 3 years of age
  - 3 years old or older

2.3.5 Camels are seen to be concentrated in some countries of the Near East, Asia and the Pacific, and Africa. Countries in general seem

to be satisfied with data on the total number of camels. However, in some countries detailed data on camels are collected. For example:

- India: (a) Number of camels less than 4 years old  
- male  
- female  
(b) Number of camels 4 years old or older  
- male  
- female
- Pakistan: (a) Number of camels less than 3 years old  
(b) Number of camels 3 years old or older  
- male  
- female

2.3.6 Data on bees are collected mainly in Europe, the Near East, and the Latin America and the Caribbean regions. In Jordan beehives are separated into two classes: local and modern. In Paraguay data on quantity of honey and wax produced are collected in addition to the number of beehives. However, Panama has collected data on honey produced but not data on the number of beehives.

2.3.7 Data on rabbits concern their total number. In Italy rabbits are separated into two categories: mothers and other rabbits.

2.3.8 All countries except Cape Verde, Rwanda, Antigua and Barbuda, Grenada, Turkey, and Yemen Arab Republic collected data on the number of poultry. Data on the use of poultry are also quite commonly collected except in Africa. But data on age are restricted mainly to Europe, the Near East, and the Asia and the Pacific regions. Two examples of countries that collected detailed data on poultry are given below:

- Jordan: Number of herds raised per year  
- broiler  
- layer  
Normal capacity of birds per each herd  
- broiler  
- layer  
Number of birds less than 6 months of age  
- broiler  
- layer  
Number of birds 6 months old or older  
- broiler  
- layer
- Puerto Rico: Number of layers less than 1 year of age  
Number of layers 1 year old or older  
Number of started pullets (raised for sale only)  
Number of fighting cocks  
Number of other roosters

2.3.9 In the majority of countries other birds are "specified" during enumeration. For the case of turkeys, in the European and the North American countries a separate place is identified in the questionnaire of the census. Similar practices are adopted for birds that are common in some other countries, for example, ducks in Paraguay and Trinidad and Tobago.

2.3.10 The fur-bearing animals are included in the questionnaires of a few countries: France, Italy, Norway, Canada, and the United States. Among the fur-bearing animals that are covered are foxes, minks and chinchillas.

2.3.11 Among other livestock, silkworms are covered in several countries: Brazil, Republic of Korea and Thailand. Some animals are covered by only a few countries. New Zealand collected the following data on deer:

Number of red deer - male - less than 1 year of age  
- 1 year old or older  
- female - less than 1 year of age  
- 1 year old or older

Number of red/wapiti cross deer  
- male - less than 1 year of age  
- 1 year old or older  
- female - less than 1 year of age  
- 1 year old or older

Number of wapiti deer  
- male - less than 1 year of age  
- 1 year old or older  
- female - less than 1 year of age  
- 1 year old or older

Number of fallow deer  
- male - less than 1 year of age  
- 1 year old or older  
- female - less than 1 year of age  
- 1 year old or older

Number of other deer  
- male - less than 1 year of age  
- 1 year old or older  
- female - less than 1 year of age  
- 1 year old or older

In India, Norway and Malawi data are collected on the number of dogs. India classified dogs into two groups: domestic dogs and other dogs.

Number of countries by region and by livestock characteristics on which they collected data: cattle and buffaloes

Region	Livestock							
	Cattle				Buffaloes			
	Total	Age	Sex	Purpose	Total	Age	Sex	Purpose
Africa	14	5	8	1	-	-	-	-
Asia and the Pac.	16	12	12	12	9	6	6	5
Europe	20	19	20	13	1	1	1	-
Latin America and the Caribbean	16	9	14	5	3	1	2	-
Near East	8	7	7	2	1	1	1	-
North America	2	1	2	2	-	-	-	-

Number of countries by region and by livestock characteristics on which they collected data: sheep, goats, pigs, horses, mules, asses, camels, bees and rabbits.

Region	Livestock																
	Sheep			Goats			Pigs			Horses		Mules	Asses	Camels		Bees	Rabbits
	Tot.	Age	Sex	Tot.	Age	Sex	Tot.	Age	Sex	Tot.	Age			Tot.	Age		
Africa (1)	13	4	3	14	4	3	7	3	2	8	1	1	6	3	1	5	3
Asia and the Pac.(2)	9	5	4	15	6	4	13	6	4	8	3	2	2	2	2	1	3
Europe (3)	21	16	12	15	6	6	19	9	12	19	6	2	2	-	-	10	9
Latin America and the Caribbean (4)	14	4	3	13	1	1	16	6	5	11	2	4	4	-	-	11	7
Near East (5)	8	8	6	8	8	6	2	1	2	4	1	1	4	6	1	4	1
North America (6)	2	2	1	1	-	-	2	-	-	2	-	-	-	-	-	2	2

- (1) Excluded from the table are 2 countries that combined mules and asses.
- (2) Excluded from the table are 2 countries that combined horses, mules and asses and one country that combined horses and mules.
- (3) Excluded from the table are 5 countries that combined mules and asses.
- (4) Excluded from the table are 8 countries that combined mules and asses and one country that combined horses, mules and asses.
- (5) Excluded from the table is one country that combined horses, mules and asses.
- (6) Excluded from the table is one country that combined mules and asses.

Number of countries by region and by livestock characteristics on which they collected data: poultry, turkeys, other birds, llamas, alpacas and fur-bearing animals.

Region	Livestock						
	Poultry			Turkeys	Other birds	Llamas and alpacas	Fur bearing animals
	Total	Age	Use				
Africa	12	1	2	2	9	-	-
Asia and the Pac.(1)	16	8	11	5	12	-	-
Europe	21	17	17	12	16	-	3
Latin America and the Caribbean (2)	15	5	14	4	12	-	-
Near East	6	4	3	3	4	-	-
North America	2	2	2	2	2	-	2

- (1) Excluded from the table are 3 countries that combined turkeys and other birds.
- (2) Excluded from the table are 2 countries that combined turkeys and other birds.

2.3.12 Regarding the age of certain types of livestock countries adopt different age classes. The following two tables indicate the age classes preferred by countries in different regions for cattle and sheep.



Number of countries by region and by age classes adopted for cattle

Region	Age classes of cattle						
	No age class	Two age classes			Three or more classes		
		-1,+1	-2,+2	-3,+3	-1,1-2,2+	-1,1-3,3+	Other
Africa	9	2	-	-	1	2	-
Asia and the Pac.	4	2	2	3	2	3	-
Europe	2	6	-	-	10	-	3
Latin America and the Caribbean	7	4	-	-	5	-	-
Near East	1	1	4	-	2	-	-
North America	1	1	-	-	-	-	-
<b>Total</b>	<b>24</b>	<b>16</b>	<b>6</b>	<b>3</b>	<b>20</b>	<b>5</b>	<b>3</b>

Number of countries by region and by age classed adopted for sheep

Region	Age classes of sheep				
	No age class	- 6 months, 6 months+	- 8 months, 8 months+	-1, 1+	Other
Africa	8	-	1	2	1
Asia and the Pac.	8	-	-	5	-
Europe	7	1	-	12	1
Latin America and the Caribbean	12	-	-	3	-
Near East	-	1	-	7	-
North America	-	-	-	1	1
Total	35	2	1	30	3

### 3. OTHER SOURCES OF DATA

#### 3.1 Livestock census

3.1.1 This is a census which should cover all livestock husbandry activities in a country. As such it should have "livestock holding" as a statistical unit. For livestock census purposes a livestock holding can be defined as follows: A livestock holding is an economic unit of livestock production under single management comprising all livestock kept without regard to title, legal form or number of livestock. Since this definition considers even keeping a few chicken only by a household as a livestock holding, a livestock census based on a complete enumeration using this definition would put undue strain on the resources dedicated to data collection. Therefore countries introduce minimum size limits (number of livestock) for livestock holdings to be included in the livestock census, or alternatively they may prefer to utilize sample enumeration instead of complete enumeration of livestock holdings.

3.1.2 The most important statistics expected from a livestock census are the numbers of animals by type, sex, age and purpose. Other characteristics of relevance are race of animals, milk animals subdivided into animals in milk and dry animals, number of eggs put in incubators, chicks hatched separately for laying hens and for broilers, facilities such as fencing and buildings watering and grazing grounds, machinery and equipment for livestock husbandry. Data on characteristics of the holder such as legal status, age and sex are also important.

3.1.3 Frequency of livestock census and its scope are closely related. If a livestock census is taken annually or twice a year, items regarding the characteristics of the holder, buildings and other facilities, machinery should be included in the questionnaire with intervals of several years.

3.1.4 If a livestock census is taken once a year it is appropriate to take it more or less at the same period of the year to establish meaningful time series of livestock numbers. Because livestock numbers undergo large variations during the year. If it is possible to conduct 2 livestock censuses in a year, it will be advisable to have one of them during the period when the numbers of livestock are near their minimum and the other during the period when the numbers are near their maximum. But conditions in the country which affect the field work may force to adopt other periods for the livestock censuses.

#### 3.2 Sample surveys on specific subjects

3.2.1 As mentioned above livestock census should provide data only on basic structural aspects of livestock husbandry in a country. Consequently many topics of interest regarding livestock are left outside of livestock census. These topics are best covered by specific sample surveys.

3.2.2 Specific sample surveys are needed for data such as: live weight; carcass weight; edible offals; milk equivalents of butter,

cheese, yogurt; clean wool equivalent of greasy wool; prices of livestock and livestock products; livestock feed; births and deaths of animals.

3.2.3 The types of surveys on specific subjects regarding livestock and livestock products are numerous. Below are listed the surveys undertaken in Canada, as an example:

(1) Annual survey of honey producers: In October all beekeepers are asked to report their production by mail.

(2) Special pig survey: About 40 000 farmers twice a year are covered to collect data on changes in numbers of pigs.

(3) Sheep and wool survey: In July each year all farmers who have sheep on their farm according to the latest census of agriculture are asked to report number of sheep, births, deaths, number shorn, amount of wool produced, quantity sold.

(4) Annual turkey survey: Each year at the end of December all farmers who have turkey on their farm according to the latest agricultural census are asked to report the number of turkeys, numbers purchased, sold, died, own consumed.

(5) Poultry and egg survey: Estimates of layer numbers are obtained by adding estimates for registered and non-registered flocks. Non-registered flock estimates are based on this survey while registered flock estimates are based on data from the Canadian Egg Marketing Agency plus layers in hatchery supply flocks. Estimates of rates of lay, price etc. are obtained through this monthly sample mail survey of poultry and egg producers.

(6) Annual fur farm census: This is a census taken at the end of each year of all mink and fox farmers. Data on the number of animals at the beginning and end of the year, the numbers bought, sold, born, lost during the year are collected.

(7) Quarterly slaughter survey: This is a mail survey of all slaughter plants not federal government inspection. Data are collected on number and type of livestock slaughtered. The same data for the slaughter houses under federal government inspection are obtained from reports submitted to Agriculture Canada.

(8) Fluid milk and cream survey: A monthly mail survey is conducted covering all dairies handling fluid milk and cream for direct human consumption. Data collected include sales by type of product and sales outlet.

(9) Survey of ice cream and related products: It is a monthly survey designed to collect information on the inputs, production and sales of these products.

(10) Survey of manufacturers of concentrated milk: This is a monthly mail survey collecting data on amounts of milk and cream purchased for concentration purpose and quantities of concentrated milk produced.

(11) Survey of manufacturers of butter and cheese: It is a monthly survey to collect data on quantities of produce and prices paid for milk and cream used in production.

(12) Survey of skim milk powder sales: This is a monthly mail survey of processors of skim milk powder to collect data on prices of milk powder sold.

(13) Survey of factory cheese other than cheddar: This is a monthly mail survey of producers of cheese other than cheddar. Data collected include monthly production and quantity in stock kept by the producers.

(14) Survey of cottage cheese production: This is a quarterly mail survey of producers of cottage cheese to collect data on production.

(15) Survey of yogurt production: This is another quarterly mail survey to collect data on yogurt production.

(16) Survey of inventories of frozen poultry products: This is a monthly mail survey of cold storages and poultry processors to collect data on storage stocks of frozen eggs and poultry meat.

(17) Survey of inventories of frozen meat products: This is a monthly mail survey of meat packers and cold-storage firms to determine the quantities of various types of frozen meat in cold storage.

(18) Survey of dairy correspondents: This is a monthly mail survey to collect data on the number of cows milked on the 15th of the month, the milk produced, the quantity of milk used on the farm and the amount of butter churned on the farm.

### 3.3 Administrative records

3.3.1 Different government agencies keep records in carrying out their administrative responsibilities. Such records are sometimes used to provide statistics as a by-product. Examples are given below:

a) Tax records.

In some countries owners of livestock are taxed for each animal.

b) Slaughter house records.

In almost all countries registered slaughter houses keep records of animals slaughtered. Some of these records include live weight and carcass weight of animals in addition to numbers slaughtered.

c) Veterinary records

Veterinary offices generally keep number of animals vaccinated.

d) Foreign trade records.

Livestock and livestock products imported in and exported from the country are recorded at the customs.

e) Bank records.

Banks have records of credits given by purpose of credit.

3.3.2 Of course not all of the administrative records cover their subjects 100%. Further there may be differences in the definitions of concepts used by various agencies. Due to such shortcomings administrative records should be utilized with care as data sources.

### 3.4 Experimental research

3.4.1 The studies aimed at discovering causal relationships between certain treatments such as different types of feeding and livestock behaviour are a useful source of information. Such studies are generally carried out at government research stations or at universities.

#### 4. SUGGESTIONS

##### 4.1 Methodology

4.1.1 An inventory of all possible sources of data regarding livestock should be taken in each country. This inventory should indicate agencies, items of data, definitions of concepts used, frequency of data collection and the legal base of such data collection activity. A group of experts from various agencies concerned, after studying the inventory, can make proposals to improve the existing data collection activities including administrative records.

4.1.2 A livestock census twice a year at 3 to 5 year intervals should be carried out. Special sample surveys should be conducted to collect specific data.

4.1.3 Special frame should be developed for nomadic livestock.

##### 4.2 Scope

4.2.1 Various items on which data are needed regarding livestock and livestock products should be listed and allocated to various data sources in a balanced manner.

4.2.2 Agricultural census should be limited in its scope regarding livestock. It should cover only total livestock numbers by type.

4.2.3 The livestock census mentioned above in paragraph 4.1.2 should be the main source of data for livestock numbers by sex, age, use and race.