

PAKISTAN LIVESTOCK CENSUS 2006

SPECIAL REPORT

Data on Milk Yield and its Parameters, Animals Slaughtered
for Meat and Commercial Poultry



**GOVERNMENT OF PAKISTAN
STATISTICS DIVISION
AGRICULTURAL CENSUS ORGANIZATION**

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**Comparison of the Pakistan Level Data of Surveys on Milk Production,
Animals Slaughtered and Commercial Poultry for 1996 and 2006**

Items	Units	Survey Data for		Per Cent Variation in 2006 over 1996
		1996	2006	
I. Average Daily Yield of Milk per In-Milk Animal	(Litters)			
Cows	"	6.061	6.146	(+) 01.4
Buffaloes	"	7.709	7.927	(+) 02.8
Goats	"	*	1.417	-
II. Number of In-Milk Animals	(Millions)			
Cows	"	6.3	08.7	(+) 38.0
Buffaloes	"	7.8	10.2	(+) 30.8
Goats	"	*	04.7	-
III. Production of Milk Per Day	(Millions litter)			
Cows	"	37.4	53.3	(+) 42.5
Buffaloes	"	62.0	82.1	(+) 32.4
Goats	"	*	06.4	-
Total	"	99.4	141.8	(+) 42.7
IV. Number of Animals Slaughtered	(Millions)			
Cattle	"	2.18	3.56	(+) 63.3
Buffaloes	"	2.18	3.34	(+) 53.2
Sheep	"	4.44	4.74	(+) 06.8
Goats	"	7.84	11.00	(+) 40.3
Camel	"	0.05	0.02	(-) 60.0
Total	"	16.69	22.66	(+) 35.8
V. Broilers				
Number of farms	(Number)	*	29,889	-
Rearing capacity (for one crop)	(Millions)	*	105.4	-
Number of birds (at enumeration time, one crop 2005-06)	"	*	70.7	-
Sales during last 12 months	"	*	336.7	-
VI. Layers				
Number of farms	(Number)	*	3,332	-
Rearing capacity (for one crop)	(Millions)	*	21.2	-
Number of birds (at enumeration time, one crop 2005-06)	"	*	16.9	-
Sales during last 12 months	"	*	11.4	-

- Not covered in 1996

PREFACE

Conducting of livestock census is now a routine feature with Agricultural Census Organization. The 2006 census is fourth in series. It has been carried out with more attention on the basis of experience gained from previous decennial livestock censuses. This report presents data on milk yield, animals slaughtered and commercial poultry, collected through three auxiliary surveys namely:

- i) Milk Production Survey,
- ii) Survey on Animals Slaughtered, and;
- iii) Commercial Poultry Survey.

The report has two main sections. The first section provides a brief description of the surveys methodology, coverage and data limitations. The second section contains 25 statistical tables prepared at district, province and country levels from the data so collected.

It is pride of Agricultural Census Organization that this task of national interest was completed well before scheduled time. I duly appreciate the staff and officers of the Organization who were helpful at every stage for carrying out these surveys.

I am personally thankful to officers and staff of Federal Bureau of Statistics who rendered their services for census enumeration, supervision and data processing within reasonable time.

Thanks are due to the provincial Livestock & Dairy Development Departments and their field staff for their regular efforts and cooperation.

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Lahore
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MAIN FINDINGS

MILK PRODUCTION

Milk Production Survey 2006 revealed that average daily milk yield per cow, per buffalo and per goat at country level was 6.146, 7.927 and 1.417 liters, respectively. Total milk production per day from all types of in-milk animals reported in 2006 Livestock Census was 141.8 million liters. In this quantity of milk, the contribution of cows was 37.6 per cent (53.3 million liters), buffaloes 57.9 per cent (82.1 million liters) and goats 4.5 per cent (6.4 million liters). The detail is presented in table below:

Average Yield of Milk per Animal per Day and Total Milk Production per Day in Pakistan

Type of Animal	Average Yield of Milk per Animal In-Milk (In Liters)			Number of In-Milk Animals (In Millions)			Production of Milk per Day (In Million Liters)		
	1996	2006	% variation	1996	2006	% variation	1996	2006	% variation
Cows	6.061	6.146	(+) 1.4	6.3	08.7	(+) 38.0	37.4	53.3	(+) 42.5
Buffaloes	7.709	7.927	(+) 2.8	7.8	10.2	(+) 30.8	62.0	82.1	(+) 32.4
Goats	-	1.417	-	-	04.7	-	-	06.4	-
Total	-	-	-	-	-	-	99.4	141.8	(+) 42.7

Comparison of 1996 and 2006 Milk Production Surveys revealed that there was slight increase in average milk yield per day per cow as well as per buffalo, i.e. 1.4 per cent increase in cows milk yield and 2.8 per cent in buffaloes milk yield. However, total milk production per day had increased by 42.5 per cent from cows and 32.4 per cent from buffaloes during the inter-census period. This increase in milk production was, primarily, due to increase in the number of in-milk cows (38.0 per cent) and buffaloes (30.8 per cent).

It is pertinent to note that Milk Production of goats has been surveyed for the first time causing addition of 6.4 million liters of goat's milk per day basis in the total Milk Production.

ANIMALS SLAUGHTERED

The data of 2006 Survey on Animals Slaughtered revealed that 22.66 million animals of all type, sex and age, were slaughtered in the country during the reference period. Comparison of 1996 and 2006 surveys on the animals slaughtered is given in the table below:

Number of Animals Slaughtered During 1996 and 2006 in Pakistan

Type of Animal	Number of Animals Slaughtered (In Million)		Per cent Change
	1996	2006	
Cattle	2.18	3.56	(+) 63.3
Buffaloes	2.18	3.34	(+) 53.2
Sheep	4.44	4.74	(-) 06.8
Goats	7.84	11.00	(+) 40.3
Camels	0.05	0.02	(+) 60.0
Total	16.68	22.66	(+) 35.8

The data of the Surveys on the slaughtering of animals conducted during 1996 and 2006 indicated that there was 63.3 per cent increase in slaughtering of cattle, 53.2 per cent in buffaloes, 6.8 per cent in goats and 40.3 per cent in camels during the inter-survey decennial period. It had, however, been observed that there was 60.0 per cent decline in slaughtering of camels during the same period. Whereas, the overall number of slaughtering of all types of animals had reportedly increased by 35.8 per cent from 1996 to 2006 period at the country level.

COMMERCIAL POULTRY

The Survey on Commercial Poultry was a first successful attempt for provision of data regarding commercial poultry farming in the country by Agricultural Census Organization. The information ascertained through the survey is given in the table on next page.

Number of Farms, Rearing Capacity, Number of Birds Reared and Sold by Type of Farm

Item	Numbers of Birds (In Million)	
	Layers	Broilers
Number of Farms	3.332	29.889
Rearing Capacity	21.2	105.4
Number of Birds (At Enumeration Time)	16.9	70.7
Sold during Last 12 Months	11.4	336.7

Table shows that at the time of survey the number of farms reported for layers and broilers farming were 3.332 and 29.889, while the rearing capacity for one crop of layers and broilers was 21.2 million and 105.4 million, respectively. The number of layers reported at the time of survey stood at 16.9 million for 2005-06 while the current crop of broilers at 70.7 million. Sale of layers during last twelve months for culling was reported at 11.4 million and of broilers for slaughtering from all crops of 2005-06 at 336.7 million.

INTRODUCTION

In Pakistan, the livestock population mainly comprises of cattle, buffaloes, sheep and goats for meeting out milk and meat requirements, while camels, horses, mules and asses for traction and transportation. Livestock is reared mostly in small herds as an essential part of small farming systems and also by landless population of rural areas indirectly associated with crop farming for substantiating their livelihood. Over the time, however, the number of medium / large sized herds are also increasing particularly to meet out the milk / meat requirements of urban areas.

The Government has, inter alia, identified the livestock sector as an engine for poverty alleviation in rural areas and thus has increased emphasis for investment in livestock production. It is considered that livestock are viable enterprises for increasing incomes of the poor by offering them job opportunity as well as enhancing their dietary levels.

The demand for milk and meat is increasing day by day due to increase in population of the country. As such the policy makers have bent upon for the development of livestock sector for improving supply of animal products i.e. milk, meat, eggs, etc. These efforts require updated statistics on all the relevant dimensions to streamline the development schemes / projects activities by all concerned. Therefore, on the directive of Government of Pakistan the Agricultural Census Organization planned to gather required data throughout the country by conducting three surveys namely:

- i. Milk Production Survey,
- ii. Survey on Animals Slaughtered, and;
- iii. Commercial Poultry Survey.

OBJECTIVES

The surveys on milk production, animals slaughtered and commercial poultry were designed to provide data on district, province and country levels with following objectives:

1. To estimate average daily milk yield per in-milk cow, buffalo and goat (only that goat whose milk was being used by human beings).
2. To provide data on different parameters of milk production i.e. breed, age, number of calving, stage of lactation, age of animal at 1st calving, lactation length and dry period duration.
3. To estimate the number of animals slaughtered for commercial purposes by butchers both inside and outside private slaughter houses as well as recognized slaughter houses and non-commercial slaughtering by individual households during a year.
4. To present data on number of commercial poultry by type of farming, rearing capacity, present flock position, sales, mortality, etc. during a year.

REFERENCE PERIOD

The data about milk production, animals slaughtered inside and outside the slaughter houses by butchers, non-commercial slaughtering by individual households and commercial poultry pertain to the period from September 2005 to July 2006 as these surveys were undertaken in five phases along with Livestock Census 2006. The phase-wise detail of districts covered is as follow:

Areas Covered	Enumeration Period
<u>Phase – I</u>	
<u>Punjab:</u> Bahawalnagar, Bahawalpur, Cholistan, Rahim Yar Khan, Khanewal, Lodhran, Vehari, Sahiwal, Pakpattan, Kasur, Okara.	September 2005 To November 2005
<u>Sindh:</u> Khairpur, Naushero Feroz, Nawab Shah, Mirpur Khas, Tando Allah Yar, Thatta, Sanghar, Umerkot, Tharparker, Badin.	

Areas Covered	Enumeration Period
<u>Phase – II</u>	
<u>Punjab:</u> Bhakkar, Layyah, Muzaffargarh, Multan, D.G. Khan, Rajanpur, Faisalabad, T.T. Singh, Jhang, Sargodha, Khushab, Mianwali, Lahore, Sheikhpura, Nankana Sahib, Narowal, Sialkot, Gujranwala, Hafizabad, Gujrat, Mandi Bahauddin, Jhelum, Chakwal, Rawalpindi, Islamabad, Attock.	December 2005 To January 2006
<u>Sindh:</u> Kashmore, Jaccobabad, Shahdadkot, Larkana, Shikarpur, Sukkur, Ghotki, Dadu, Jamshoro, Tando Muhammad Khan, Hyderabad, Matiari, Karachi.	
<u>Phase – III</u>	
<u>Balochistan:</u> Jafarabad, Nasirabad, Jhal Magsi, Bolan, Sibi, Chagai, Kharan, Lasbella, Awaran, Panjgur, Khuzdar, Turbat, Gawadar, Kohlu, Musa Khel, Barkhan.	March 2006 To April 2006
<u>N.W.F.P.:</u> Swabi, Mardan, Nowshera, Charsadda, Peshawar, Khyber Agency, F.R. Peshawar, F.R. Kohat, Mohmand Agency, Kohat, Karak, Bunnu, F.R. Bunnu, North Waziristan Agency, Lakki Marwat, F.R. Lakki, D.I. Khan, F.R. D.I. Khan, Tank, F.R. Tank, South Waziristan Agency.	
<u>Phase – IV</u>	
<u>N.W.F.P.:</u> Hungu, Aurakzai Agency, Kurrum Agency, F.R. Kurrum.	May 2006 To June 2006
<u>Balochistan:</u> Quetta, Mastung, Pishin, Killa Abdullah, Ziarat, Loralai, Zhob, Killa Saifullah, Kalat.	
<u>Phase – V</u>	
<u>N.W.F.P.:</u> Malakand Agency, Lower Dir, Upper Dir, Bajour Agency, Chitral, Haripur, Abbottabad, Mansehra, F.R. Mansehra, Battagram, Kohistan, Shanglapar, Buner, Swat.	July 2006

The reference period however for the number of animals slaughtered in the recognized slaughter houses pertain from March 2005 to February 2006.

COVERAGE

The *Milk Production Survey* was conducted throughout the country except the districts of Dera Bugti, Mastung, Kalat, Khuzdar, Awaran, Kharan, Kech (Turbat), Gwadar, Punjgoor in Balochistan province; Kohistan, Chitral, Upper Dir, Lower Dir, all the Frontier Regions and Agencies in NWFP and Greater Cholistan, De-Excluded areas of D.G. Khan and Rajanpur in Punjab province.

The data about *slaughtering of various types of animals* for non-commercial purposes and commercial purposes outside the recognized slaughter houses were collected from the entire country along with Livestock Census 2006. However, for the information on animals slaughtered in the recognized and cantonment slaughter houses as well as in the slaughter houses meant for export, the district authorities of the provincial Livestock & Dairy Development Departments and authorities of the Cantonments were consulted. The districts / FRs / Agencies which communicated non-existence of recognized slaughter houses in their respective jurisdiction are DE-EX D.G. Khan, DE-EX Rajanpur and Cholistan in the Punjab; Batagram, Kohistan, Shangalapar, Buner, Lower Dir, FRs Peshawar / Kohat / D.I. Khan / Bannu / Lakki / Mansehra / Tank / Kurrum, agencies of Malakand / Mohmand / Kurrum / Aurakzai / North Waziristan / South Waziristan in NWFP and Dera Bugti, Ziarat, Loralai, Musa Khel, Barkhan, Bolan, Awaran and Gwadar in Balochistan.

The data about *Commercial Poultry* were also collected with the main census throughout the country from the selected mouzas / villages / urban blocks of each district / FR / Agency. However, the districts from where no data have been reported due to non-existence of any commercial poultry farm in the selected mouzas / villages / urban blocks are not consequently included in the tabulation for that province.

SAMPLING PLAN

A sample of 5 to 20 mouzas was selected from each district for *Milk Production Survey* depending upon the size of the district in terms of its total number of mouzas. From each selected mouza, a few households aggregately possessing 10 or more in-milk animals (cows as well as buffaloes) and five goats of any breed, age, number of calving and stage of lactation were randomly selected. During selection of in-milk animals, the proportion of selected cows and buffaloes was kept, more or less, consistent with the proportion of in-milk cows and buffaloes in the mouza. The maximum proportion was, however, maintained at 3 versus 7 between the selected cows and buffaloes or vice versa. Moreover, not more than 3 animals of one type from one household were selected for milk production survey to maintain sample spread. If any selected household possessed more than three animals of one type, only 3 animals of that type were selected at random from that household before moving to next selected households for making selection of in-milk animals randomly so that aggregate of in-milk animals become equal to the pre-determined number of that type of animal. In addition, five goats (whose milk was reportedly being consumed by human beings) were also selected from each mouza already selected for milk production survey. In this way, 4,342 cows, 4,284 buffaloes and 2,836 goats scattered throughout the country were selected.

The data on *Animals Slaughtered* were collected by adopting three pronged strategy which is given below:

- i. The information regarding religious obligatory / occasional / ceremonial slaughtering of animals was collected from all the selected households for Livestock Census 2006.
- ii. The rural / urban butcher shops situated on any place in the selected mouzas / villages / urban blocks for Livestock Census 2006 were enumerated on hundred per cent basis to get information about their commercial slaughtering carried out anywhere outside the recognized slaughter houses.
- iii. The data on animals slaughtered inside the recognized, export purpose and cantonment slaughter houses situated anywhere in the district were collected from all districts of the country through the respective District Officer of the provincial Livestock & Dairy Development Departments and cantonment authorities.

All the commercial poultry farms reported in a selected mouza / village / urban block were enumerated on 100 per cent basis.

QUESTIONNAIRE

Livestock Census 2006 presents information about the number of in-milk cows, buffaloes and goats (milking for human consumption). This information provided basis for the selection of households and in-milk animals for Milk Production Survey. For *Milk Production Survey* a separate questionnaire (Form-8) was designed and used, Appendix-IV. For carrying out selection procedure Form-8 (A) was used. In Form-8, one row was reserved for each selected cow or buffalo or goat for recording the information such that one questionnaire was enough to record the information of all the selected animals of each type from one selected mouza.

Data on *slaughtering of animals* by ordinary households at different religious / ceremonial occasions for household consumption was collected through main census questionnaire (Form-2), Appendix-I. Information about the number of animals of various types slaughtered by rural / urban butchers outside the recognized slaughter houses was recorded on a separate questionnaire (Form-5) designed for this purpose, Appendix-II. One questionnaire was sufficient to record information of all the butchers and their individually slaughtered animals from one selected mouza / village / urban block. Moreover, the information on the number of animals slaughtered by butchers at recognized slaughter houses of each district, export purpose and cantonment slaughter houses was collected by mailing a specially designed questionnaire (Form-5A) to the District Livestock Officers and cantonment authorities. One questionnaire was used for recording information of one slaughter house which was added-up to get district aggregates.

For data collection of *Commercial Poultry*, a separate questionnaire (form-7) was designed, Appendix-III. All the commercial poultry farms of any type situated in a selected mouza / village were enumerated on hundred percent basis. One form was used for one poultry farm even if there were multiple types of poultry rearing activities.

ENUMERATION PROCEDURE

Milk Production Survey was conducted by the staff of Agricultural Census Organization. The staff deputed for this purpose was provided necessary training for selection of in-milk animals (cows, buffaloes and goats) and filling the questionnaire. Only one official was deputed to one district. Each enumerator was provided with measuring pot of one-litre capacity, showing the gauge up to 100 ml.

During the training for main census, the enumerators from the provincial Livestock & Dairy Development Departments were directed to complete the census work on priority basis in the mouzas selected for milk production survey. This arrangement was made to get information about in-milk animals (cows, buffaloes and goats) for their further selection for this survey. The enumerators informed the head of household (s) of selected in-milk animals about the date of visit for recording milk yield at least one day prior to the visit so that the animal (s) could be milked in their presence and information on other parameters relating to milk production could be collected. The enumerators subsequently visited each selected household on the agreed date and measured the yield of milk and recorded information as per questionnaire.

The information about *slaughtering of animals* by ordinary households at various occasions for their own consumption was recorded from all selected households of selected mouzas / villages / urban blocks during main census enumeration work. Information about animals slaughtered by butchers of rural and urban areas outside recognized slaughter houses was also collected during the main census by enumerating each butcher selling meat in the selected mouza / village / urban block at a permanent or temporary shop. Every butcher, whether a regular or an occasional meat seller, was enumerated for getting information on slaughtered animals.

Data about the number of animals slaughtered inside the recognized, export purpose and cantonment slaughter houses were collected through a separate questionnaire designed for the purpose by mailing the same to each District Livestock Officer of Livestock & Dairy Development Department and cantonment authorities. They were requested to complete one form for each recognized, export purpose and cantonment slaughter house situated in their district.

Commercial Poultry was enumerated during main census enumeration period by visiting and recording information about each poultry farm situated in the selected mouza / village / urban block either empty at that time or with any flock. Information about area, rearing capacity, number of birds reared, present flock position, mortality and sales were collected for each poultry farm. One questionnaire was sufficient for recording multiple poultry activities of the farm.

DATA PROCESSING AND ESTIMATION OF RESULTS

Average milk yield per day per in-milk animal (cow, buffalo and goat) of a district was estimated by dividing total milk yield of selected animals of each type with their respective total number of animals within a district. Total *milk production* per day for a district and province was calculated by multiplying the respective total number of in-milk cows with its average yield per day per cow, total number of in-milk buffaloes with average milk yield per day per buffalo and by total number of in-milk goats (whose milk was reportedly being consumed by human beings) with average milk yield per day per goat and then adding up of these results. The province level estimates were then added up to arrive at country estimates.

The data concerning *slaughtering* for household consumption outside slaughter houses by individual households was estimated by using the same methodology as has been used for the Livestock Census 2006 census data. In this procedure the district level estimation was made by multiplying the relevant raising factors with sum of selected households' reported slaughtering of various types of animals on Eid and other days of the census year.

The data regarding commercial slaughtering outside recognized slaughter houses in rural / urban areas by the butchers was also estimated by multiplying respective raising factors of each district.

The data on animals slaughtered inside recognized, export purpose and cantonment slaughter houses as reported by the District Livestock Officer of each district and cantonment authorities were added up to get slaughter house estimates. All the above noted estimates were added up to arrive at the overall district estimates which were further summed up for obtaining province and country estimates.

The data concerning the *Commercial Poultry* in the country were estimated with the same methodology as adopted in estimation of Livestock Census 2006 data. In this procedure the district estimates were made by multiplying the relevant raising factors with the reported information in the questionnaires. These district estimates were added up to get province and country estimates.

LIMITATIONS OF DATA

i. Milk Production Survey

1. The survey was based on sample enumeration, its results are therefore subjected to sampling and non-sampling errors.
2. The data about age of animal, stage of lactation, number of calving, lactation length might have memory biases.
3. There were some superstitious respondents and were thus reluctant to allow for the measuring procedures. The data of such respondents were based on their reporting.
4. This data is not comparable with the recorded information of the organized government or private dairy farms being the farmers' level data.
5. This survey was carried out in the period from September 2005 to July 2006. Therefore, the results could have been affected as the milk yield per animal varies in various seasons of the year.
6. This survey was conducted in the rural settled areas of the country. This average has however, been used for estimating total milk yield per day of each district for rural as well as urban areas and also for the unsettled areas of the country.
7. Average milk yield for each breed of cows, buffaloes and goats was estimated by dividing total milk yield of a breed within the district with the respective breed-wise number of selected animals. It may not match with breed average available in the literature being the farmers' level data.
8. It is apprehended that breed-wise data on milk yield for some breeds might be missing particularly at district level because various breeds are found in various ecological zones and chances of their non-selection may not be ruled out in each district.

ii. **Animals Slaughtered**

1. The data about the slaughtering of animals by individual households were asked for the last complete year. This long duration may affect data due to memory bias.
2. It is felt that some butchers might not have provided correct data due to fear of tax net.
3. The slaughtering of animals varies with seasons of the year. Therefore, this factor could have caused some variation in the data.
4. The slaughtering reported by recognized, export purpose and cantonment slaughter houses might have been affected due to recording errors of the record keepers.

iii. **Commercial Poultry**

1. This is first set of data on commercial poultry activities in the country by Agricultural Census Organization. Therefore, there might exist ample chances for improvement.
2. All the commercial poultry farms situated in the selected mouzas /villages / urban blocks for main census 2006 were enumerated. Therefore, the degree of reliability for the estimates on broilers may be high, as the broilers farming is wide spread activity. Whereas, the estimates on layers and parent stocks may be used with caution as their farming is concentrated in pockets here and there on map of the country.
3. During census period there were rumours of "Bird Flue", which might have caused some effects on the estimates.
4. There are a few districts in each province from where no commercial poultry farming has been reported. This might be the reality or the result of sample based enumeration. All such districts have not been mentioned in their relevant province.
5. The survey was carried out along with the Livestock Census 2006 and its field operations completed during September 2005 to July 2006. Therefore, the Financial Year-wise presentation of data for layers, broilers, etc. is difficult and involved overlapping/omission of the reference period. The data for current crop of layers (Table-18, Col. 4) and of last twelve months of broilers (Table-19, Col.5) may conveniently be considered for 2005-06, respectively.
6. The data for broilers and layers for the current crop may be taken cautiously because the span for a crop of broilers ranges from 45 to 60 days while for a crop of layers from 12 to 24 months.

7. Due to non-reporting, Table No.17,18,19,23,24 and 25 do not represent the districts of Kohistan, Chitral, Upper Dir, Cholistan, Tharparkar, Jaccobabad, Killa Abdullah, Kohlu, Dera Bugti, Ziarat, Musa Khel, Barkhan, Killa Saifullah, Zhob, Bolan, Jhal Magsi, Awaran, Panjgur, FRs. of Peshawar, Kohat, D.I.Khan, Bannu, Mansehra, Kurrum, Laki Marwat, agencies of Aurakzai, North Waziristan, South Waziristan and De.Ex.Area of Rajanpur.
8. Parent stock farming is rare and area specific activity, therefore, data might have larger variation, the users may use cautiously.
9. Quail farming is also rare activity therefore, in the selected mouzas no activity has been reported in the survey.