Instruction manual

Integrated Sample Survey

Contents

Chapter One

Introduction: Concepts, Definitions and procedures

1.0 Introduction:

The production of major Livestock Products (MLP), namely, milk, eggs, meat & wool is estimated on the basis of annual sample surveys being conducted under the Central Sector Scheme "Integrated Sample Survey". The scheme is implemented by Department of Animal Husbandry, Dairying & Fisheries through State Animal Husbandry Departments. All the States and Union Territories are implementing the Scheme.

Timely availability of reliable and current data relating to various livestock indicators through Integrated Sample Survey is essential for evolving, monitoring and evaluating various developmental schemes in this sector. Time series data on milk yield per lactating animal and total number of lactating animals help the State Animal Husbandry Departments to assess the impact of their efforts, particularly towards disease control, genetic up-gradation and feed & fodder management. Further, reliable production estimates of MLP and the estimates of feed and fodder consumption are vital for preparing the estimates of value of output and the estimates of GDP from this sector.

1.1 Coverage of Survey

The Survey is conducted in the entire rural and urban areas of States/UTs. The survey is conducted in the selected sample villages/urban wards enlisting all household enterprises, non household enterprises institutions like all farm houses, slaughter houses, butcher shops pursuing annual husbandry and related activities.

1.2 Period of Survey

The Survey is conducted from March to February. The entire period of one year is divided into three Seasons of 4 months each. These Seasons are:

Name of the Season	Period of collection of data
Summer Season	1st March to 30th June **(122 days)**
Rainy Season	1st July to 31st October **(123 days)**
Winter Season	1st November to 28th or 29th February. *(**120 days or 121** days in a leap year)*

This helps in building up progressive estimates of aggregate as also takes care of seasonality, if any, in the character(s) under study. The activities envisaged in the survey and the time line prescribed for each of those activities is listed in the table which follows.

Activities	Time Line
Responsibilities by State Head Quarter	
Ensuring availability of Schedules for every districts	The required number of schedules should be made available to districts **two week before the start of the season**
Selection of 15% Sample villages/urban wards (selecting 5% samples each seasons) or two week before for the start of each season by State Head Quarter and intimating the samples to concerned Districts	By **15th February** of ever year
Responsibilities by District Head Quarter	
Planning for the field work and selection of 5% sample and making the sample into two sub-samples.	By **2nd fortnight** of the preceding month of every season
Canvassing of Schedule I & II for Complete Enumeration	Within **First week** of the First Month of the season
Formation of hamlet groups *{where the total no of population of a particular sample villages/urban wards is more than 1200}*	-do-
5% sample check of the complete enumeration work during the first round of every season	-do-
Selection of minimum of 4 villages and one urban ward each from both sub-samples.	Within **two days** after completion of Schedule-IIs(by 10th day of the First Month of the season)
Cluster formation and drawing sample of households/ enterprises for detailed inquiry from selected villages from each of the two sub-samples.	-do-
Completion of First Round	By **30th Day of the First Month** of the season
Compilation of data of the First Round at District Head Quarter	Within **2 days** after the completion of the First Round
2nd to 4th Round • Enumeration work	By 20th day of the particular month
Compilation of Seasonal Estimate by District Head Quarter and submitting the estimates to State Head Quarter	Within the First Week after end of every Season.
Responsibilities by State Head Quarter	
Validation of Data and Compilation of Estimates by State Head Quarter for every districts and submitting the summary sheet to DADF, New Delhi.	Within One Month after completion of the season

The above time line may be strictly adhered to for timely submission of the survey results in each season.

1.3 Sampling Design:
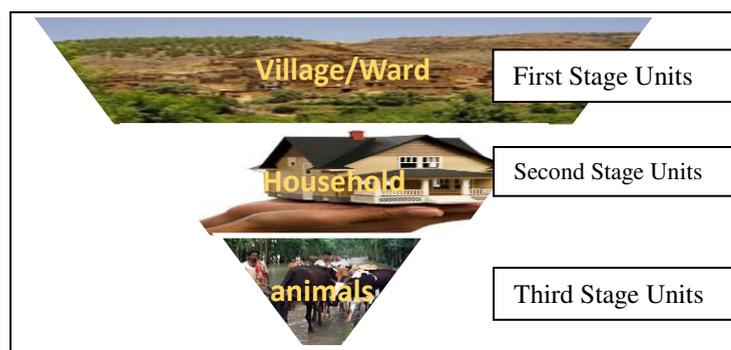
The sampling design is a stratified three stage design with district as stratum. The first stage units are villages/ urban ward, second stage units are households and third stage units are animals.

1.4 Selection of sample of villages for complete enumeration

1.4.0 The list of latest Livestock Census villages constitutes the sampling frame. For the estimation of livestock **numbers**, 15% (5% of each season) of the villages/urban wards will be selected *in the form of two independent sub-samples in a State for complete enumeration of livestock and poultry population (5% in each season) by using Simple Random Sampling Without Replacement (SRSWOR).* The number of villages will be allocated to each district (i.e. stratum) in proportion to its livestock population. From the list of these two sub-samples of villages, a representative sample of 4 villages and one urban ward each will be further selected for detailed study for collection of information on yield at the district level. The sample size may be increased in smaller states/UTs based on the staff resource available where number of villages as well as livestock population significantly less and based on the staff resources available.

1.4.1 Equal number of sample villages from each sub-sample will be allocated among the three seasons.

1.4.2 Number of villages/urban wards to be selected for complete enumeration: Based on number of villages in a district, at least 15% of the sample villages are to be selected as per the following plan.

Number of villages/ward in the smaller States/UTs/District.	Number of villages to be selected in the district in a year
More than 750	10% villages subject to maximum 80 villages
400 -- 750	10% villages subject to maximum 60 villages
250 -- 400	15% villages subject to maximum 50 villages
100 -- 250	25% villages subject to maximum 40 villages
50 -- 100	40% villages subject to maximum 30 villages
20 -- 50	50% villages
less than 20	All villages

Note: a) For selection of urban wards, 15% of total urban wards will be selected for completed enumeration b) Complete enumeration of at least 1/3rd of the total no. of villages should be completed in each season of the year.

1.4.2 Instruction for selection of sample of villages:

Firstly before selection of villages/ urban wards, the villages/ urban wards which are uninhabited and/ or having no livestock should be removed from the sampling frame.

For drawing random numbers for the selection of villages/ urban wards for complete enumeration and for detailed inquiry, the column in the random number table to be referred to, should be specified. The **district code and year** of survey may be added and the last two digits of the number thus obtained may be used for referring the column number in the random number table for drawing random numbers for selection of villages/urban wards. If random number gets exhausted in the specified column, then next column in the random number table may be used. After selecting villages for complete enumeration, they should be given serial number for selecting villages for detailed inquiry. The steps to be followed are given as under with an example.

Step 1:   Selection of column of Random number Table

- District code:598,say

- Year: 2014
- Total 2612
- Last two digit 12
- 12th Column of Random no. table

Step 2: Selection of Random Numbers, for example no. of villages in a district is 800

- 16152
- 53585
- 83472
- 16013
- 76748
- 59199
- 77227
- Continue…

Step3: selected villages with serial number

- 152
- 585
- 472
- 013
- 748
- 199
- 227
- Continue… till 120 villages are selected(15% of 800 villages)

Step 4: arranging with serial numbers of the selected villages in the order of selection

- Sub Sample 1 (Say Villages 1 to Village 60)
- Sub Sample 2 (Say Villages 61 to Village 120)

> Step 5: Selection of villages for detailed inquiry from each sub–sample

1.4.4: Selection of sample villages / urban wards, both for complete enumeration and detailed enquiry, for the entire State should be done by the State Headquarters. A soft copy of the sample list of villages/ urban wards may be provided to this Department, preferably through e-mail.

1.4.5: All efforts should be made to provide information on number of in milk cows, in milk buffaloes, in milk goats in the sample list of villages/urban wards in the format suggested below:

Name of District			District code						
Village/ ward name/c ode	**Sub sample 1 or 2**	**Tehsil**	**No of animals as per 19th LC 2012 or breed survey 2012** **Estimated Population 2012**						
			In milk exotic cattle	In milk crossbred cattle	In milk indigen ous cattle	In milk non-descript cattle	In milk indigen ous buffalo es	In milk non-descript buffalo	In milk goat

> The methodology used for estimation of number animals in rural sample shall be used for urban samples also for estimation of livestock population and production from urban area.

1.4.7: The selection of sample of villages / urban wards for complete enumeration in the form of two independent sub-samples would facilitate in calculating **Relative Standard Errors (RSE)** using the simple formula:

$$RSE = \frac{Positive\ value\ of\ (\hat{R}_1 - \hat{R}_2)}{\hat{R}_1 + \hat{R}_2} *100 \text{ where}$$

$\hat{R}_1$ = Estimates of the character under study from the sub sample of 1

$\hat{R}_2$ = Estimates of the character under study from the sub sample of 2

If RSE is found high, the limit for the sample size for the selection of villages/ urban wards may be revised provided manpower and resources permits.

1.4.7: *The estimate of the character under study from combined sample i.e. for sub-sample 1 and 2 together will be simple average of $\hat{R}_1$ and $\hat{R}_2$*

1.4.8: Some Instructions for State Head Quarters:

- Till such time, the office of Assistant Directors (Livestock Statistics) at the block of four districts are created, State Headquarters may continue to process and tabulate the data generated through Integrated Sample Survey.

- In addition to estimation of production of major livestock products at district and State level, the State Headquarters may also prepare sub-sample wise seasonal/ annual estimates on number of animals/birds and yield rate for calculating Relative Standard Errors for these estimates at State level.
- Once the office of Assistant Directors is created, these estimates at district level may be prepared by them and State Headquarters may prepare season-wise/ annual estimates at State level as well as their Relative Standard Errors.

1.5 Selection of Sample of the Households (II stage) and animals (III stage)

1.5.0: The list of households of the sample village for detailed study serves as sampling frame.

The survey is conducted in each month of the season, which has been named as 'round'. The selection of sample of households/ enterprises in the first round and subsequent rounds is as under:

1. Milk (Cattle & Buffalo)

Round (Months)	No. of sample households (Second stage Units)	No. of animals (3rd Stage Units)
1st to 4th Round (Month)	One clusters of 2 households each for exotic, crossbred, indigenous, non-descript cattle and indigenous & non-descript buffaloes. **{Total 12 households fixed for every season}.** In case selected households are not having in milch goats, two additional Households to be selected.	Two animals in-milk from each households of Exotic, Crossbred, Indigenous, ND cattle and Buffaloes i.e. **24 animals to be selected. All in milk goat.** *In case of No Exotic all crossbred may be considered. In case of no exotic & crossbred, all indigenous may be considered. In case of no exotic, crossbred & indigenous, all Non-descript may be taken} Shortfall may be fulfilled from higher grade of cattle/buffalo also.*

2. Egg

Round (Months)	No. of sample households (Second stage Units)	No. of animals (3rd Stage Units)
1st to 4th Round	2 clusters of 5 households each **Total 10 households fixed for every season**	All laying birds

3. Meat

Round (Months)	No. of sample households (Second stage Units)	No. of animals (3rd Stage Units)
1st to 4th Round (Month)	(i) For estimation of Number of animals slaughtered • All the households in the selected villages/wards for the sample • All Butcher shops in the selected sampled village/wards of the sample.	• No. of Animals/Poultry Slaughtered in each households/ butcher shops.

4. Wool

Round(Months)	No. of sample households (Second stage Units)	No. of animals (3rd Stage Units)
1st Round to 4th Round(Month)	**8 households fixed for every season**	Two rams/wethers, two ewes, two lambs *{Total 48 sheep} or as available in the selected sample.*

Note: Recording of wool yield is done in the shearing season in the selected villages/ward and invariably be recorded during the season.

1.6 Commercial poultry farms- for egg and meat production

State Animal Husbandry Departments may obtain the information on number of layers maintained and average yield per layer per season from all the commercial poultry farms for estimation of egg production in the commercial farms. In addition, the information on broiler and layer chicks placed in all the commercial poultry farms

during the season from hatcheries /poultry farm associations/ supplying agents in the State for estimation of meat production in the commercial farms may also be obtained by the State Animal Husbandry Departments.

1.7   Slaughter houses- for Number of animals slaughtered and yield rate

The number of animals slaughtered will be taken from all registered slaughtered houses as on 1st day of the season. i.e for Summer Season it is 1st March , Rainy 1st July and for Winter 1st November.

The information on number of animals slaughtered will be collected by the State/UT as administrative return in every month regularly. The information thus obtained shall be compiled to provide the seasonal-wise data as mentioned above.

Estimation of Yield rate: For Estimation of yield rate two slaughter houses will be selected in a district in which <u>2 young and 2 adult animals will be selected under each category.</u>

1.8 Important concepts and definitions used in different schedules of Integrated Sample Survey:

House: A house is a building or part of a building having a separate main entrance from the road or common courtyard or stair case, etc. used or recognised as a separate unit. Every structure, tent, shelter, etc. is a house irrespective of its use. It may be used for residential or non-residential purpose or both or even may be vacant.

Household: A group of persons normally living together and taking food from a common kitchen will constitute a household. Head of household will be that member of the household who is accepted generally as the head of the household by the members of the family. He/she may or may not be the major earning member. It should be left to the members of a household to decide upon whom they consider to the head of the household. A house may have single or multiple households.

Enterprise: An enterprise is an undertaking which is engaged in production and or distribution of some goods and or services meant mainly for the purpose of sale.

Household enterprise: A household enterprises is one which is run by one or more members of a household or run jointly by two or more households on partnership basis irrespective of whether the enterprise is located in the premises of the household or not.

Non-household enterprise: A non-household enterprises is one which is institutional i.e. owned and run by the public sector, private corporate sector (include public and private limited companies registered as joint stock companies under the Companies Act 1956), Co-operative societies, other type of societies, institutions, associations, trusts, etc.

Institution: For the purpose of this Survey, Temple, Mosque, Gurudwara, etc will be covered under Institution.

Rural and Urban Areas:

An urban area, according to the Census definition, consists of:

1) Statutory towns: All places with a municipality, corporation, Cantonment Board or notified town area committee, etc. so declared by state law. And

2) Census towns: Places which satisfy following criteria are declared as town:-

a) A minimum population of 5000;

b) At least 75 percent of male working population engaged in non-agricultural pursuits; and

c) A density of population of at least 400 persons per sq km.

In addition to it, some areas falling in the vicinity of city or town are also considered as urban area if they are treated as the out growths (OGs) of the main urban unit.

Rural Areas: All areas not covered under statutory towns and Census towns will be considered as Rural Areas for the survey.

Village/Ward: In the rural areas the smallest area of habitation, viz., the Village/Ward generally follows the limits of a revenue Village/Ward that is recognized by the normal district administration. The revenue Village/Ward need not necessarily be a single agglomeration of the habitations. But the revenue Village/Ward has a definite surveyed boundary and each Village/Ward is a separate administrative unit with separate Village/Ward accounts. It may have one or more hamlets. The entire revenue Village/Ward is one unit. There may be un-surveyed Village/Wards within forests etc., where the locally recognized boundaries of each habitation area are followed within the larger unit of say the forest range officer's jurisdiction.

Hamlet-group: A hamlet group may be defined as a geographically drawn sub-division of a village or urban ward which is divided by certain geographical boundaries.

Indigenous Animals: Animals which belongs to descript/non- descript breeds of indigenous origin. Native breed of animals which phenotypic characteristics are recognised and registered by National Bureau of Animal Genetic Research are known as indigenous breed otherwise they are called Non-descript.

Exotic Animals: Animals which are developed in other countries are described as exotic animals. The most important exotic dairy cattle breeds used in India are Jersey and Holstein Friesian (HF).

Crossbred Animals: Animals which are produced by crossing indigenous animals with exotic breeds or indigenous animals which have exotic inheritance are described as crossbred animals.

Animals in milk: Animals in milk production are described as animals in milk. The normal age at the time of first calving is two and half years for exotic/crossbred cows while it is 3 to 4 years among indigenous cows and buffaloes.

Dry Animals: Animals which are calved but at present not in production are described as dry animals. Animals which cannot be calved in future are not covered under this category.

Broiler: Poultry birds that are reared for the purpose of meat production are broilers. These birds complete their growth within 6 to 8 weeks.

Layers: Layers are those poultry birds which lay eggs.

Poultry Farms: Farms having more than 1000 poultry birds will be considered as commercial poultry farms. Government Farms irrespective of their size would be treated as commercial farms for the purpose of the survey. Other farms will be covered under backyard poultry.

Slaughter house: It means a slaughter house wherein 10 or more than 10 animals are slaughtered per day and is duly licensed or recognised under a Central, State or Provincial Act or any rules or regulations made there under.

Butcher shops: These are smallest selling points of meat where number of animals slaughtered will be less than 10.

Unit and population: The Unit is a well-defined and identifiable element or group of elements on which observations could be made. The aggregate of the units under study is termed as the population.

Sampling Unit: The population is to be sub-divided into suitable units for the purpose of sampling and these are called 'sampling units'. The sampling units should be well-defined and identifiable to be used for sampling and investigation.

Sampling Frame: For using sampling methods in collection of data it is essential to have a frame of the sampling units with their proper identification particulars. As the sampling frame forms the basic material from which a sample is to be drawn it should be made up to date and free from omission and duplication.

1.9 Simple Random Sampling with Replacement and without Replacement (SRSWR, SRSWOR)

1.9.0 If a sample is drawn and selected sampling units of preceding draws are allowed to be observed in the succeeding draws also, then sampling is called with replacement (-WR), whereas if they are not allowed, it is called Sampling without Replacement (-WOR). An easy way of drawing a sample is by way of Simple Random Sampling without replacement. Each unit of population is drawn one by one till required number of units, by assigning equal probability of selection to each of the available units at the first and each subsequent draw. If unit selected in previous draw is again selected and allowed in the sample it is SRSWR, if not, then it is SRSWOR.

Steps required to draw a sample is

    (1)   Identify Sampling Units (Example Schedule-II).

    (2)   Read/Generate Random Number(s).

    (3)   Take out the Sample

1.9.1 For drawing the sample the example given below may be followed.

Example-1. Draw a Sample SRSWOR of 4 schools from a list of 40 schools. Let random numbers be 32, 78,68,91,80,01,23,03.

Method-1 The sample will be {(32),(80),(68),(91),(78),(01),(23)and(03)}; rejecting if the random number is > 40.

Method-2 The sample will be {(32),(40),(28),(11)};

1.9.2 Sampling units are same as the random number if the selected random number is less than 40. Sampling units are selected on the basis of remainder obtained on dividing random numbers by 40, if random number is >40. '40' is specific to this example. Here 40 is the total population size: in this case 40 is the total number of schools available.

The method-2 is economical to method-1, whereas method-1 is easy to operate.

Chapter Two

Complete Enumeration

2.0 Schedules I

2.0.1: *Schedule-I* *is a record based schedule consisting two parts; (i) to be obtained from the District/Sub-District administration (ii) to be collected and recorded based on Schedule-II of Integrated Sample Survey.* It details the number of animals as per the latest Livestock Census/Breed Survey.

2.0.2 General information about village/urban ward selected for complete enumeration:

In this block, the information regarding seven items are to be filled-in besides Period of Survey and identification of area i.e. Rural/Urban. The period of the survey should be the complete period of the survey.

Under items (i) to (iv) of this block the particulars of the village or the urban ward selected for survey shall be recorded which are self-explanatory. The item (iv) should be filled-in based on the codes as developed by the Office of the Registrar General India for various administrative areas. This code should be written in the boxes from right justified.

The items (v) should be filled-up indicating the number of subsample in which the selected village belongs *to* i.e. in *sub sample-1 or sub-smple-2.* The item (vi) should be filled –up with the name of season i.e *summer, rainy winter.*

2.0.3 Particulars of the selected village/urban ward

This block contains items from (i) to (xiii) which are record based information using different sources as mentioned below.

- The items (i) to (ii) should be filled-up using the latest Census records of the village.

- The Items (iii) to (iv) are on number of the hamlet groups in case the selected village is not to be surveyed completely due to more than 1200 population in the village. The name of the selected hamlet groups may be recorded as *hg-1 or hg-2 or hg-3* as the case may be. The formation of hamlet group should be done as per instruction under section **2.2 of chapter-2**

- The items (v) to (xi) are to be filled-up using the records of Agriculture Census or the through enquiry from village *patwari.*

- The information sought under column (xii) to (xiii) are to be filled-up through enquiry from the concerned veterinary hospital of the village.

2.0.4 Block-3: Livestock and Poultry population according to the Breed Survey 2012 and Livestock Cenus-2012 or Estimated population of Breed Survey 2012 for selected village/ward.

Block-3 is designed to record information on livestock and poultry in the selected sample using (i) Livestock Census or Breed Survey data, (ii) based on Block-5 of listing Schedule-II. The description of each item is mentioned below.

- The population, i.e. number of animals in each category of species such as Cattle, Buffalo, etc. is to be filled up in column (2) using the latest Livestock Census population or Estimated animal population from Breed Survey data. The information that are not available under Livestock Census may be filled-up using the Breed Survey data. For example, the information separately for exotic and crossbred breeds of cattle will be available only in Breed Survey results.

- The column(3) of Block-3 is to be filled up after completion of the listing for the entire village or the hamlet group in Schedule -II

- If the hamlet groups are surveyed instead of complete villages/ward then the estimated number of animals in each species will be recorded in column(3) by using the methods specified under **section 2.2.2**.

- The column (3) of the Block -3 should be left blank in case of other species which are NOT covered under the survey such as Horses, Ponies, Camel etc. However, in this case, the column (2) should be filled-up using latest Livestock Census data.

- Apart from the above any other livestock which are found in the village and possessed by the household may be recorded under the item "Other Livestock".

2.0.5 The field staff must keep District Livestock Census Report or hard and soft copy of details of Livestock and poultry numbers by age, sex and use for filling up details in this block of Schedule I.

2.0.6. Statistical enumerator should carry with him adequate number of copies of different forms/schedules, other stationery and weighing equipment such as spring balance etc. **Milk recording should be made in kilograms by actual weighment**.

2.0.7 Block-4: Reasons for declining cattle and buffaloes population.

- This block is to record the information on the reasons for declining the cattle and buffaloes population. This block is to be filled up after observing the differences between column (2) and column (3) of Block-3 in Schedule-I. The enumerator shall collect the information through oral enquiry method in consultation with the knowledgeable persons in the village/urban ward.

- Name & signature of both enumerator and supervisor are compulsory.

2.1 Schedule II (Selected for Complete Enumeration)

2.1.1 In complete enumeration all the livestock and poultry birds in the selected villages/wards are to be counted. <u>All the household enterprises and non-household enterprises/institution in the village/urban ward will be listed in Schedule II.</u> The detailed explanation for each block and columns of this schedule is given as under:

Block 1: General information about selected village/urban ward
In this block, the information regarding six items are to be filled-in besides Period of Survey and identification of area i.e. Rural/Urban. The period of the survey should be the complete period of the survey.

Under items (i) to (iv) of this block the particulars of the village or the urban ward selected for survey shall be recorded which are self-explanatory. The item (iv) should be filled-in based on the codes as developed by the Office of the Registrar General India for various administrative areas. This code should be written in the boxes from right justified.

The items (v) should be filled-up by rounding off the respective number (1 or 2) based on which subsample the selected village belongs to. The item (vi) should be filled –up with the name of season i.e. *summer, rainy winter.*

Block 2: Household summary detail
The items under the block are filled-up after completion of listing process. The item (a), the total number of households shall be filled up as per latest population census.

The item (b), the total households in the village will be taken as the **last serial number of Column (3)** of the Block-5 of schedule –II. Similarly the items from (b) to (k) shall be filled up by observing the last serial number of the respective species or the breeds of the species from Block 5 of Schedule II.

Block 3: Animal Summary Detail

In this block total number of animals in the village is recorded based on the listing done under Block-5of Schedule-II as mentioned below:

Cattle							
Exotic		Crossbred		Indigenous		Non- Descript	
In milk	Dry	In milk	Dry	In milk	Dry	In milk	Dry
1	2	3	4	5	6	7	8
Total of column no. (7)	Total of column no. (8)	Total of column no. (15)	Total of column no. (16)	Total of column no. (23)	Total of column no. (24)	Total of column no. (31)	Total of column no. (32)

Buffaloes				Sheep			Goats		Poultry			
Indigenous		Non-Descript							Layers			
									Fowls		Ducks	
In milk	Dry	In milk	Dry	Adult male	Adult female	Young stock	In milk	Dry	Desi	Improved	Desi	Improved
9	10	11	12	13	14	15	16	17	18(a)	18(b)	19(a)	19(b)
Total of Col. (39)	Total of Col. (40)	Total of col. (47)	Total of col. (48)	Sum total of col.(53) & (57)	Sum total of col. (54) & (58)	Sum total of col. (55) & (59)	Total of col. [63(a)]	Total of col. [63(b)]	total of col. (79)	total of col. (80)	total of col. (87)	total of col. (88)

*For Villages with Hamlet Groups: In the case of villages having hamlet group, the above numbers will be corresponding of totals of the hamlet groups. The enumerator shall add an additional row after recording the total number of animals in each hamlet group. This additional row shall indicate the total estimated number of animals in the village. The estimation may be done as per the method explained under **section 2.2.*** An illustration in case of <u>Cattle</u> is mentioned in the following table.

Hamlet Group	Exotic		Crossbred		Indigenous		Non- Descript	
	In milk	Dry	In milk	Dry	In milk	Dry	In milk	Dry
1	2	3	4	5	6	7	8	9
Hamlet Group 1	*Total of column no. (7)*	*Total of column no. (8)*	*Total of column no. (15)*	*Total of column no. (16)*	*Total of column no. (23)*	*Total of column no. (24)*	*Total of column no. (31)*	*Total of column no. (32)*
Hamlet Group 2								
Estimated Number of Animals in the Village								

Note: It may also be noted that the entries in the in the listing schedule may be made in order of hamlet groups and the page totals should be separately recorded for every hamlet group.

After completion of entries in the first hamlet group the running serial number may be used for collecting the information of the household/enterprises of the hamlet group-2.

Block 4: Number of Animals Slaughtered

In this block there are two items which will be carried forwarded from two blocks Block-5 and Block-6 of Schedule-II. The items are filed up based on adding the column totals under Blocks 5 and 6 as mentioned below.

	Cattle	Buffalo	Sheep	Goat	Pig	Poultry	Others (Specify)
By Households in the village(from block [I])	Sum totals of columns no. (89), (90)	Sum total of columns no. (91), (92)	Sum totals of columns no. (93), (94)	SUM total of columns (95), (96)	Sum totals of columns no. (97), (98)	Total of column no. (99)	Others of column (100)
By Butchers in the village(block [II])	Sum totals of columns (2) ,(3)	Sum totals of columns (4) ,(5)	Sum totals of columns (6) ,(7)	Sum totals of columns (8) ,(9)	Sum totals of columns (10) ,(11)		Sum totals of columns (12) ,(13)

In case of hamlet formation in the selected village, the instruction explained under Block-3 in the preceding section may be followed for recording the estimated number of animals slaughtered in the village.

Block 5: Listing of households/enterprises

This is very important block in schedule-II where actual survey data are recoded. The enumerators should take at most care while filling-up of the block. This block contains ***Columns (1) to (102)*** which are filled up from the enquiry in every household/household enterprises**.** The illustrations on filling up of these columns are detailed below:

Household Serial number: Column (1) to Column 3):

The column (1) is the House number of households. Column (2) is the name of head of households/household enterprises and column (3) will be the running serial number of the households.

Cattle Exotic Columns (4) to (11)

Column (4) This column will be filled up as per the example explained below:

If the first household is having cattle exotic, then serial number one as '1'will be recorded for the particular households. If the 10th household is having cattle exotic, then serial number two as '2' will be recorded.

Columns 5(a) to (10) will be recorded by the enumerator by physically counting the no. of Exotic cattle in the respective category. *Serial number to be allotted if and only if the column having exotic cattle by the households and columns 5(a) to (11) are filled.*

Column (11) will be the total number of exotic animals in the household.

Cattle Crossbred Columns (12) to (19):

Column (12) to be filled up as explained under the section of cattle exotic animals.

Columns 13(a) to (18) will be recorded by the enumerator by physically counting the no of Crossbred cattle in the respective category. Column (19) will be the total number of Crossbred animals in the household.

Cattle Indigenous Columns (20) to (27):

Column (20) to be filled up as explained under the section of cattle exotic animals.

Columns 21(a) to (26) will be recorded by the enumerator by physically counting the no of indigenous   cattle in the respective category.

Column (27) will be the total number of indigenous animals in the household.

Cattle Non-Descript Columns (28) to (35):

Column (28) to be filled up as explained under the section of cattle exotic animals.

Columns 29(a) to (34) will be recorded by the enumerator by physically counting the no of Non-Descript cattle in the respective category.

Column (35) will be the total number of Non-Descript animals in the household.

Buffaloes Indigenous Columns (36) to (43):

Column (36) to be filled up as explained under the section of cattle exotic animals.

Columns 37(a) to (42) will be recorded by the enumerator by physically counting the no of Buffaloes Indigenous in the respective category.

Column (43) will be the total number of Buffaloes Indigenous animals in the household.

Buffaloes Non-Descript Columns (44) to (51):

Column (44) to be filled up as explained under the section of cattle exotic animals.

Columns 45(a) to (50) will be recorded by the enumerator by physically counting the no of Non-Descript Buffaloes in the respective category.

Column (51) will be the total number of Buffaloes Non-Descript animals in the household.

Sheep Exotic/Crossbred Columns (52) to (56):

Column (52) to be filled up as explained under the section of cattle exotic animals.

Columns (53) to (55) will be recorded by the enumerator by physically counting the no of Exotic/Crossbred cattle in the respective category. *In Column (55), for recording of young stock the age less than one year for both male and female shall be considered.*

Column (56) will be the total number of Exotic/Crossbred animals in the household.

Sheep Indigenous/Non-Descript Columns (57) to (60):

Column (57) to be filled up as explained under the section of cattle exotic animals.

Columns (58) to (59) will be recorded by the enumerator by physically counting the no of Sheep Indigenous/Non-Descript in the respective category. *In Column (59), for recording of young stock the age less than one year for both male and female shall be considered.*

Column (60) will be the total number of Sheep Indigenous/Non-Descript animals in the household.

Goat Columns (61) to (65):

Column (61) to be filled up as explained under the section of cattle exotic animals.

Columns (62) to (64) will be recorded by the enumerator by physically counting the no of animals in the respective category. *In Column (64), for recording of young stock the age less than one year for both male and female shall be considered.*

Column (65) will be the total number of goat both male, female and young stock in the household.

Pigs Columns (66) to (68):

Columns (66) to (67) will be recorded by the enumerator by physically counting the no. of pigs in the respective category.

Column (68) will be the total number of pigs in the household.

Poultry Columns (69) to (88):

Column (69) will be the running serial no of those households having poultry. Therefore the serial numbers will be given based on the possession of the poultry birds by the Households as explained in the previous section.

Columns (70) to (88) will be recorded by the enumerator by physically counting the no. of poultry birds in the respective category under Cocks, Hens, Chickens and ducks.

No. of animals slaughtered by Households during last 4 months Columns (89) to (100)

The columns (89) to (100) are to be recorded from every household during the listing process by the enumerator. The total number of animals and poultry birds slaughtered by the households during the past 4 months will be recorded here. In the case of animals the numbers have to be recorded separately for Adult and Young category.

Area Covered under Green fodder Column (101 to 102)

This column (101) is to be filled by the enumerator through probing each household on the area they used for green fodder cultivation and the total production shall be recorded under Column (102).

Block-6: No. of Animals Slaughtered during last 4 months by Butchers and other agencies in the village or within a radius of 2 Km.

Column (1) will be the name of the agency/ butcher shop. The other columns in this block, i.e Columns (2) to (13) will be filled up by the enumerators by enquiring with deep probing with owner of the butcher shop about the no. of animals slaughtered during previous 4 months.

The enumerators shall identify and record the data from those butcher shops/ other agencies stationed within 2 K.M radius of the selected village.

2.1.2 Listing as well as detailed survey in the selected sample villages/urban wards will be done by the statistical enumerators. In States/UTs where shortage of statistical enumerators exists Veterinary officials (Livestock Extension Officers, etc.) may be engaged for survey activities.

2.1.3 These schedules will be completed during **first week of each season**. Planning for the field work for detailed study should be done in such a manner so that it is ensured that the work of complete enumeration is finished in the villages/urban wards selected for the detailed study by the end of the month.

States/UTs should NOT deploy any of its field staff to other assignments during the period of complete enumeration.   Director, State Animal Husbandry Department should ensure for the same.

2.2 Selection of hamlet groups (hgs):

2.2.1 For reducing the listing work in **Schedule II,** hamlet groups (hg) may be formed in selected sample village/urban wards having more than 1200 population. After identification of the boundaries of the sample village/ward, it may be determined in consultation with knowledgeable person of the village/ward whether listing will be done in whole sample village or not? In case human population of the selected village/ward is found to be 1200 or more, it may be divided into a suitable number (say, D) of hamlet groups (hgs) as stated below:

Approximate present population in the sample village	Number of hamlet groups to be formed
Less than 1200	No hamlet group formation
1201 to 1800	3
1801 to 2400	4
2401 to 3000	5
3001 to 3600	6
............and so on	

2.2.2 In case Hamlet Groups are to be formed, the same should be done by more or less equalizing population. While doing so, it may be ensured that the hamlet groups formed are clearly identified in terms of physical land marks. Two hgs may be selected (one hg with maximum percentage share of livestock population may always be selected; one more hg may be selected from the remaining hgs by simple random sampling). Number of animals in the village may be estimated by multiplying listed number of animals in the two selected hgs with D/2.

2.2.3 **Instruction for the villages in which hamlet groups are formed**:
Enumerator will collect information only in the selected hamlet groups. In the summary block of schedule II one additional row will be formed. In the first row number of animals counted in the selected hamlet groups will be recorded. In the second row estimated number of animals in the village, as per method mentioned in Para 2.2.2, will be recoded. Similarly information on number of animals slaughtered during last four months will be filled up in the summary block.

2.3 Listing of houses

2.3.0 Procedure **for listing of houses:** In order to ensure   complete listing of houses/households, it is better to follow some definite order for listing. The order followed in **2011 Population** Census may be adopted, wherever possible, taking care that any house that has come up later is not omitted. Otherwise, listing may be done in serpentine manner starting from the north-west corner and moving southwards. The names of any natural grouping of the houses like hamlet, street, *mohalla*, etc. and date of listing may be written at the top before the listing of houses starts. This will help in ensuring completeness.

2.4 House numbers

2.4.0 **Procedure for giving house numbers:** The 2011 Population Census house number or the number given by the local panchayat or other local bodies, may be used if available. However, for the houses without such numbers, a uniform procedure has to be adopted for numbering them. They will be given a separate running serial number starting from 1 within brackets. Whenever house numbers are available, even if not for all the houses, the actual house numbers shall be recorded without any brackets

Details of Column (4) column (12), column (20), column (28), column (36), column (44), column (52), and column (61) column (69) facilitate selection of households and animals/birds i.e selection of Second and third Stage units.

2.5 Other important Guidelines

2.5.0 Field staff canvassing the Schedule-II should collect information from 80 to 100 households per day in plain areas and 40 to 50 households per day in hilly and difficult areas.

2.5.1 **Five per cent sample check** of the complete enumeration work done by the Departmental staff during the first round of every season should be done by the statistical enumerator/supervisory field staff under the scheme.

2.5.2 The information on number of animals in production as collected through complete enumeration in the first month of the season should reach the State Headquarter for computerization by the First fortnight of the second month of the season positively and the estimates of livestock number should be compiled before the end of respective season (for those states where data compilation is done at State Head Quarters). However, efforts may be made by all those State to compile the data at district level and generate the district level estimates in consultation with the State Head Quarters.

Supply of digitalised information in respect of selected sample of villages/urban wards to the State Head Quarters on total number of animals counted during the ISS survey and as per Livestock Census would facilitate in quick compilation of season wise estimates of number of animals at the district level.

2.5.3 Enumerator will check as to whether the figure on number of households enumerated during complete enumeration is consistent with total number of households as per the Population Census 2011. If these figures are not consistent, the reason for the variation should be explained by Enumerator/Supervisor in the Schedule II.

2.5.4 Enumerator will check as to whether the existing population of cattle and buffaloes are exactly same as the livestock census/breed survey 2012 population. Increase or decline in cattle and buffaloes population, causes of increase/decline should be ascertained from knowledgeable person of the selected sample and recorded in the block II of schedules I positively.

Chapter Three

Detailed Survey-milk yield-Schedule-III
[Schedule-III to be repeated in every round of the season]

3.0 Selection of Cluster of Households and Animals

In the sample of villages/urban wards for detailed Study in every round, one cluster of 2 households/enterprises each will be selected from each of the category of cattle and buffalo for collection of data on milk yield as indicated under section 1.5 of the Instruction manual.

The Block-2 of the Schedule-III will give the details of selection of cluster of households for milk. For selection of clusters of households/enterprises for recording of yield per lactating bovine allotted random number is divided by the highest Sl. No. of households/enterprises having milch bovines *(in each of the category, exotic, crossbred, indigenous and non-descript both for cattle and buffalo as the case may be)* to get cluster of households/enterprises selected. The random number will be one digit if number of households having milch bovines is below 10, it will be of two digits, if number of households having milch bovines is between 10 and 99 and it be of three digits, if number of households having milch bovines is 100 and more but less than 1000.

The selection of clusters of households for every category of animals for collection of detailed data on milk yield should be done once in a particular season from the list prepared in column (4), (12), (20), (28), (36) and (44) of Block-5 of Schedule II. If none of the households selected for detailed study of milk yield possess goat in milk then 2 more households/enterprises having goats in milk should be selected from the list prepared in column (61) of Block 5 of Schedule II for recording milk yield of goat.

So far as selection of animals in milk in a household for recording data on milk yield is concerned, two animals will be selected from each of the selected households under each category of cattle/buffalo. For example, if the selected households are in Exotic category, then two exotic animals will be selected for measuring the yield rate from that household. Similar exercise may done for other categories of cattle as well as buffalo. It may be possible that same households may repeat in more than one category.

In case any of the categories of animals in milk are not available in the sample, then other category of animals may be selected. All goats in milk within a household/ enterprise will be taken into account for recording the milk yield.

3.1 The detailed explanation of each Block and columns of Schedule-III is given as under:

Block 1: General information about selected village/urban ward

In this block, the information regarding nine items are to be filled-in including Period of Survey and identification of area i.e. Rural/Urban. The period of the survey should be the complete period of the survey.

Under items (i) to (iv) of this block the particulars of the village or the urban ward selected for survey shall be recorded which are self-explanatory. The item (iv) should be filled-in based on the codes as developed by the Office of the Registrar General India for various administrative areas.

The items (v) should be filled-up by rounding off the respective number (1 or 2) based on which subsample the selected village belongs to. The item (vi) should be filled –up with the name of season i.e. *summer, rainy winter. In item (vii), the round of the season i.e 1st, 2nd, 3rd or 4th month of the season to be specified by rounding off the number.*

Block 2: Selection of Household/Household Enterprises for detailed enquiry:

Serial No of the Households Column (1): Serial number of households as per listing schedule shall be recorded.

Allotted Radom Number Column (2): This column will be the random number as observed from the random number table.

Remainder Key Column (3): This is the number which is obtained after dividing the random number as in Column (2) with the Highest serial number of the households having the specific breed of the species or the species itself.

Selected Cluster of Household Column (4): This is the serial number of the household selected which will be called as selected cluster of household. If the 10th Household is selected then the cluster will be formed by selecting the nearest household either 9th or 11thas the case may be.

SI.No. of substitute H.H. Column (5): This column refers to the household which is substituted to replace the initially selected household due to non-existence of the specified category of animals or due to reasons of *calving stage become dry, death etc.* at that point of time in a particular round. In this case the reason for substitution may be noted by the enumerated **at Column (7)** at Remarks and should be verified by the concerned supervisor.

Date of recording column (6): Here the actual date of recoding the selection of household/enterprises shall be reported.

The above instructions shall be repeated in all species of animals as mentioned in the Block-2 of Schedule-III.

Block-3: Identification of selected H.H./Enterprise of selected villages/urban ward.

Identification of the Household Columns (1) & (2): These columns are filled-up based on the selected households as per Block-2 and as selected under Block-2 of Schedule-III

Size of the family Columns (3) to (5): In these columns the details of family size will be recorded. *If the selected sample unit is an enterprise, column (3) to (5) will be left blank.*

Use of milk produced Columns (6) to (8): These columns refer to the use of milk by the household. The enumerator shall put tick (√) marks based on the information given by the household. *If the selected sample unit is an enterprise, column (6) to (8) will be left blank.*

No. of animals in milk on the day of visit Columns (9) to (15): These columns shall be filled-up based on the number of animals of Cattle, Buffalo and Goat possessed by the household on the day of the visit by the enumerator. *The enumerator may have a check on the variation of the number of animals during the time of listing and on the current day.*

Block 4: Milk yield of individual animal on the day of visit

Sl. No. as in Block 5 in Schedule-II having the specified species of animal column (1): This columns should be same as that of used while listing the households/enterprises in the village as in Block-5 of Schedule-II.

Identity of the animal column (2): The identity of the animal in the form of running serial number should be recorded here. For example, in the case of Cattle exotic, there should be total of four animals to be selected in such a way that 2 each from the two households having exotic animals. Thus a serial number may be given as "1" or "2" accordingly against each selected households.

Breed Details column (4) & (5): The breed name and breed code as per the instructions provided during Breed Survey-2012 may be used while recording the information. (Breed code is in annexure)

Details of calving and lactation Columns (5) to (7): The details of number of calves born, number of lactation and calendar month of last calf born should be recorded here. *For a lactating cow that has calved twice, number of lactation completed would be one. In column (7) information will be recorded on calendar month of last calf born for example January 2011, February 2011, March 2011, etc.*

Milk yield (kg.) Column (8) to (11): milk yield of the animal on the day of the visit relates to the quantity actually drawn into the pail or bucket and should exclude the portion sucked by the calf from the udder. Enumerator will record animal-wise information on milk yield in Kilograms. *He will visit twice in a day to the selected household when animals are milked by the sample household/enterprise for recoding milk yield in the evening and in the morning.*

The milk yield of the selected animal in the morning, noon and evening will be recorded at Columns (8) to (10). The day's total should be recorded at Column (11).

Block-5: Details of average daily feed consumption during last 30 days

This Block relates to the feed consumption of the animals in the household/enterprise as observed on the date of visit. The information is to be recorded on green, dry fodder and concentrates separately for each animal. In case of joint feeding, the details of animals fed together should be indicated and ratio in which feed is consumed should be mentioned after careful enquiry from the household members. Whatever green & dry fodder or concentrates are given to animals by baskets, weigh the basket with and without the feed/fodder and record the correct quantity of feed and fodder given to animals after making an allowance for the weight of empty basket. The column-wise description is given below:

Identification of the Household Columns (1) & (2): These columns are to be filled-up based on the households selected and as indicated under Block-2 of Schedule-III.

Category (Exotic/Crossbred/Indigenous/ND Cattle/Buffalo) column (3): The category of the animals will be recorded here**.**

Classification (Adult Male/Adult Female/Young Stock) column (4): The classification of the animals whether adult for both male and female or young stock shall be recorded here. *The appropriate codes should be used from the foot note of the block.*

Number of animal column (5): The total number of animal in the selected household/enterprises under the specified category shall be recorded here.

Grazed/stall fed/both column (6): The information shall be recorded based on the information provided by the household on nature of feeding. *The appropriate codes should be used from the foot note of the block.*

Feed Consumption (Kg/day) column (7) to (10): These columns shall be filled up by enquiring on the average daily feed consumed by the animals during last 30 days according to green, dry and concentrate fodders.

Hours of grazing: Hours of grazing Column (11): The hours of grazing shall be recorded based on the information provided by the household.

Block 5(A) Details of utilization of Cow milk produced on the previous day (kg.)

Identification of the Household Columns (1) & (2): These columns are to be filled-up based on the households selected as under Block-2 of Schedule-III.

Produced Column (3): The **total cow milk produced** by the household shall be recorded here (in kg).

Purchased Column (4) to (5): The total cow milk purchased by the household shall be recorded here (in kg) with quantity rate of purchase.

Sold as liquid milk Column (6) to (7): The **total cow milk sold** by the household shall be recorded here (in kg) with quantity and rate of sale

Kept for conversion into milk products Column (8): The quantity of the cow milk kept for conversion into milk products shall be recorded (in kg).

Consumed (in the household/ enterprise) Column (9): The quantity of cow milk consumed by the household/enterprises shall be recorded (in kg).

The above instructions shall be repeated in the case of other species such as Buffalo and Goat as per Blocks 5(B) and Block 5(C).

Block 5(D) Summary of total Milk utilization from Cow, Buffalo and Goat:

In this block total utilization of milk from cow, buffalo and goat shall be reported based on the entries made in the other blocks.

Block 6(a): Utilization of dung (cattle and buffalo) collected on the previous day:

Information this Block will be recorded by enquiry from the informant in the household/ enterprise. The number of baskets/buckets be recorded and after subtracting actual weight of buckets, the quantity of dung collected and its disposal viz. converted into dung cakes, manure and other purposes etc. should be recorded. The items wise description are discussed below:

Identification of the Household Columns (1) & (2): These columns are filled-up based on the households selected as under Block-2 of Schedule-III.

Total No. of animals Columns (3) to (5): Column (3) will be the category of the animal to be filled using the codes as per the footnote. The respective codes shall be given by the enumerator for Adult and Young Stock.

Total No. of Baskets/Buckets Column (6): Total number of baskets of dung collected during previous day will be recorded here.

Weight per Basket/Bucket (kg.) Column (7): Weight per basket/bucket will be recorded in kilograms.

Total wt. of dung produced Column (8): Column (8) =Column (6) × Column (7)

Utilization (kg.) Columns (9) to (11): The quantity of dung utilized *(on the previous day of data collection)*by the households for making dung cake, dung manure and other uses of dung such as biogas shall be reported in this column.

Block 6 (b). Utilization of dung of Goat collected on the previous day

The Columns (1) to (5) are to be filled up as per instructions under Block 6(a). The other columns namely Column (5) is to be filled up by enquiring the household on the amount dung produced and shall be noted in kilograms. The Columns (6), (7) are related to utilization of dung which is to be filled up based on the dung utilized by the household on the previous day. All the households selected under Cattle & buffaloes shall be considered here for recording the utilization of dung of goats. *If the selected households under Cattle and buffaloes are not having any goats then two additional households having milch goats are to be selected for recording the milk yield and these households will be further probed for recording the utilization of dung of goats.*

Chapter Four

Egg Production- Schedule-IV & Schedule V
[Schedule-IV to be repeated in every round of the season]

4.0 Details of egg production in selected households/enterprises

Block 1: General information about selected village/urban ward

In this block, the information regarding nine items are to be filled-in including Period of Survey and identification of area i.e. Rural/Urban. The period of the survey should be the complete period of the survey.

Under items (i) to (iv) of this block the particulars of the village or the urban ward selected for survey shall be recorded which are self-explanatory. The item (iv) should be filled-in based on the codes as developed by the Office of the Registrar General India for various administrative areas.

The items (v) should be filled-up by rounding off the respective number (1 or 2) based on which subsample the selected village belongs to. The item (vi) should be filled –up with the name of season i.e. *summer, rainy winter. In item (vii), the round of the season i.e. 1st, 2nd, 3rd or 4th month of the season to be specified by rounding off the number.*

Block 2: Selection of households Columns (1) to (7):

In the sample of villages/urban wards for detailed Study in all rounds, two cluster of 5 households/enterprises having poultry birds will be selected for collection of data on egg yield as indicated under section 1.5.

This block will give the details of selection of cluster of households for egg. The selection of clusters of households for collection of detailed data on egg yield should be done once in a particular season from the list prepared in column (69) of Block-5 in Schedule II.

For selection of clusters of households/enterprises for recording of yield per layer allotted random number is divided by the highest Sl. No. of households/enterprises having layer birds under Column (69) of Block-5 in Schedule II to get cluster of households/enterprises selected.

The selection of substitute household shall be based on the non-existence of layers on the date of the survey.

Block 3: Identification of selected H.H./Enterprise in the village/town Columns (1) to (7):

The identification particulars of the household name of head of household, main occupation and family size shall be reported in these columns.

Block 4: Production, Purchase and Disposal of eggs during the last 7days

Sl. No. of H.H./Enterprise: Column (1) : This column refers to the serial number of the household which is selected for recording the yield rate as recorded under Block-2.

Fowl/Ducks Column (2): The category of the poultry birds shall be recorded in this column for every group of improved or *desi* fowl or ducks as the case may be.

Breed (Improved/Desi) columns (3): The breed name of fowl/duck shall be recorded here.

Total Number of Layers Column (4): Average number of layer birds available during last seven days shall be reported for every selected household/household enterprises. *The enumerator shall do deep probing to understand the number of layers possessed by the household on each day of the week and then the average number of layers may be recorded.*

Number of Eggs laid Column (5): The total number of eggs laid by fowls or ducks during last seven days in each selected household/household enterprises shall be reported.

Number of Eggs Purchased Column 6(a) to 6(b): The number of eggs purchased and rate per dozen during last seven days by the selected household/household enterprises shall be reported in these columns.

Number of Eggs Consumed at Home Column (7): The eggs consumed during last seven days by the household/household enterprises shall be reported.

Number of Eggs Kept for Hatching Column (8): The total number of eggs kept for hatching during last seven days shall be reported.

Number of Eggs Sold Column (9): The number of eggs sold by each selected household/household enterprises during last seven days shall be reported.

Price of Eggs sold per dozen Column (10): The average price of the eggs sold per dozen by household/household enterprises shall be reported.

Number of Eggs Damaged Column (11): The total number of eggs damaged during last seven days shall be reported.

Balance Column (12) This column is computed by Column (12) = [Column (5)+ Column (6a)] - [Column (7) + Column (8) + Column (9) + Column (10) + Column (11)]

Number of layers used for Meat purposed Column (13): The total number of layer poultry birds used for meat purpose shall be reported.

4.1 Schedule V: Details of egg production in the commercial poultry farms

4.1.0 The information for the Commercial Poultry Farms, i.e. a Farm having 1000 poultry birds and more and **Government Farms irrespective of their size,** should be recorded in this schedule. This has to be obtained from all Commercial Poultry

Farms. A copy of this Schedule is to be sent to all registered commercial Poultry Farms along with a letter from Managing Director of Poultry Corporation/Animal Husbandry Director, requesting the farm owner to send the desired information on seasonal basis. While requesting for season wise information duration of the season must be clearly indicated in the schedule. In case of continuous non-response, enumerator should personally be deputed to collect the information. The itemised description of the schedule is given below:

Block 1: General Information:
In this block the items (i) to (vii) are to be filled up by the owner of the poultry farm.

Block 2: Details of poultry birds and its yield rate:
This block contains five columns which are to be carefully filled up by the poultry farm owners. The information are to be recorded for desi and improved birds separately.

If the information are collected by the State in every month from each poultry farms, then the State Animal Husbandry Department may ensure that these administrative returns are compiled and furnished to GOI on seasonal basis.

Chapter Five

Wool production- Schedule VI

[Schedule-VI to be repeated in every round of the season]

5. 0 Selection of households/household enterprises:

In the sample of villages/urban wards for detailed Study, a sample of 8 households is selected for collection of data on wool yield. For the purpose of selection of households/enterprises on wool production column (52) of Block-5 of Schedule II should be referred to. In respect of sheep, select two rams, two ewes and two lambs at random from all the sheep in the a household/enterprise for the purpose of recording their wool yield. Sheep and wool Development Staff in the field may be associated for recording of wool yield.

5. 1 Programme of Work:

The programme of work may be classified as the work to be done in the shearing season and the work to be done during the off season:

a) During the off season, the fieldwork consists of contacting the selected sample households/ enterprises having sheep in the selected villages for the detailed study and noting down the information in Blocks 2 and 4 of the Schedule.

b) During the shearing season, information on wool yield and other related items will be recorded in Block-3. Wool yield of the selected ram/weather/ewe lamb, etc. be recorded by actual weightment at the time of the shearing.

5.2 Selection of Sheep:

Selection of Sheep for recording wool yield: From each selected household in a village two rams, two ewes and two lambs will be selected for recording wool yield in the shearing season. For making such selection of sheep, the sheep (ram/ewe/lamb) are serially numbered and random number of one or two or three digits as the case may be (depending on the number of sheep in the household, i.e., if below 10 then one digit, if sheep are between 10 and 99 then two digits 100 and more but less than 1000 then 3 digit number table are to be used) are selected and that number is divided by the highest number of sheep in the household and the remainder obtained will be the serial number of the sheep to be selected for the sample. The rams, ewes and lambs will be seal numbered separately.

5.3 Itemised description of Schedule VI

Block 1: General information about selected village/urban ward

In this block, the information regarding nine items are to be filled-in including Period of Survey and identification of area i.e. Rural/Urban. The period of the survey should be the complete period of the survey.

Under items (i) to (iv) of this block the particulars of the village or the urban ward selected for survey shall be recorded which are self-explanatory. The item (iv) should be filled-in based on the codes as developed by the Office of the Registrar General India for various administrative areas.

The items (v) should be filled-up by rounding off the respective number (1 or 2) based on which subsample the selected village belongs to. The item (vi) should be filled –up with the name of season i.e. *summer, rainy winter. In item (vii), the round of the season i.e 1st, 2nd, 3rd or 4th month of the season to be specified by rounding off the number.*

Block 2: Details of selection of household/household enterprises for detailed survey Columns (1) to (7):

This block is to be filled up as per the instruction provided in previous chapter. However, the selection of household/household enterprises should be based from household/household enterprises having sheep population. *The highest SI No .of H.H./Enterprises having sheep shall be recorded at the right corner cell of this block by observing the total of Column (52) of Block-5 of Schedule II*

Block 3: Particulars of selected household/household enterprises in the village/Urban ward:

Serial No. of household/household enterprises as per block 2 of Schedule VI

Column (1): This column should be filled up based on block 2, i.e. the selected household/household enterprises having sheep population.

Name of the Head of the household/household enterprises Column (2): This column indicates name of the head of the household/household enterprises.

Size of the family Columns (3) to (5): The total number of family members including adult and children shall be reported in these columns. If the selected sample unit is an enterprise, column (3) to (5) will be left blank

Main Occupation Column (6): The main occupation of the head of the household/household enterprises shall be reported. If the selected sample unit is an enterprise, column (6) will be left blank

Stationary/Migratory Column (7): The enumerator shall record the nature of the sheep rearing in each selected household/household enterprises by indicating 'stationary' or 'migratory' based on majority norms.

Breed Column (8): The breed name of the sheep population shall be recorded from the breed list provided. The breed name shall be based on majority of the sheep.

Total No. of Sheep in the selected Household Column No. (9) to (14)

Adult (Ram/Ewe) Columns (9) to (11): The total number of adult sheep population in ram and ewe with their total shall be reported.

Young Stock (Male/Female) Columns (12) to (14): The total number of Young stock sheep population in male and female with their total shall be reported. *The young stock will be those sheep up to 1 year.*

Block 4: Disposal of sheep during the last season Columns (1) to (12):

This block contains twelve columns for recording information on number of sheep disposed, which contains information of head of household, stock at the beginning of the season, cause of death, sale, sale rate per sheep, purchase, rate of purchase per sheep, consumption, both slaughtered as well as other purpose. In columns (9) & (10) the other mode of disposal may be recorded by the enumerator in case the sheep are disposed-off for the purpose other than slaughtering. The column (11), the total stock at the end of the season shall be recorded by computing *[Column (3)+ Column (7a)]-[Column (4)+ Column (6a)+ Column (8)+ Column (10).*

Block-5: Utilization of dung (kg.) Columns (1) to (7):

The quantity of dung utilized *(on the previous day of data collection)*by the households for making dung cake, dung manure and other uses of dung such as biogas shall be reported in these columns.

Utilization of dung of Sheep collected on the previous day

The Columns (1) to (4) are on identity and total number of sheep in the selected household/household enterprises. The other columns namely Column (5) is to be filled up by enquiring the household on the amount of dung produced and shall be noted in kilograms. The Columns (6), (7) are related to utilization of dung which are to be filled up based on the dung utilized for manure and biogas by the household on the previous day.

Block 6: Wool yield of selected sheep (In grams):

The wool yield is estimated by selecting six sheep, two ram, two ewes and two lamb from each selected household. As per the revised methodology eight household are to be selected in entire season for estimating yield rate. These households will be fixed for entire season.

Serial No. of household/household enterprises as per block 2 of Schedule VI Column (1): This column should be filled up based on block 2, i.e. the selected household/household enterprises having sheep population.

Breed Column (2): The breed name should be recorded for the selected sheep (ram/ewe/lamb) as per breeds of the sheep recognized by NBAGR.

Selected Category Column (3): The categories of sheep namely ram, ewe, lamb shall be considered for every household/household enterprises.

Wool Yield (in grams) Column (4): The wool yield from each category of sheep i.e. ram, ewe, lamb are recorded for every selected sheep.

Total Sheep in the household Column (5): The total number of sheep in each category shall be recorded.

Total No. of Sheep Sheared Column (6): Total no. of sheep sheared in the household/household enterprises shall be recorded against each category.

5.4 Sheep and wool Development Staff

Sheep and wool Development Staff may be associated for recording wool yield of selected sheep. Director AH/Sheep husbandry should ensure this.

Chapter Six

Meat Production Schedule VII & Schedule VIII

So far as data on meat production is concerned, information number of animals slaughtered will be collected from all recognised slaughter houses in the district and from all households and butchers in all the sample of villages/urban wards selected for complete enumeration as per Schedule II.

6.0 Schedule VII: Information on yield of meat from recognized slaughter houses (on the day of visit)

6.0.0 Information on number of animal slaughtered will be collected through two sources, i.e. Registered Slaughter House and Households, Butchers & other agencies in selected sample of villages. So far as the data on meat yield are concerned, the same has to be collected by selecting 4 animals shall be selected at random from each category, cattle and buffalo, goat, sheep and pig by considering 2 adults and 2 young from two recognised slaughter houses in the district. However, meat produced by commercial poultry farm is collected through administrative returns in the form of schedule-VIII.

> *The number of animals slaughtered in the registered slaughter houses is obtained as administrative return from each registered slaughter house every month* **and total 4 months data are to be compiled and reported by the State as on First day of the coming season.**

6.0.1 Itemised description of Schedule VII

Block 1: General Information about recognized slaughter houses:
Items (i) to (iv) indicates the particulars of district, block, village/town in which the slaughterhouse is located. Item (v) is name and address of the slaughterhouse. The name of the season may be recorded at item (vi). The item (vii) of this block will be date of the visit by the enumerator if the slaughterhouse is selected for collecting yield rate or the information is not furnished by the registered slaughterhouse.

Block 2: Basic Information as on 1st day of month of the season:
This block contains four items in which at Columns (2) to (4) the number of animals slaughtered during previous four months shall be recorded against each category.

Block 3: Details of animal slaughtered and its yield rate:

For estimating the meat production per animal, <u>4 animals, two adult and two young from every species shall be selected from the identified slaughterhouses.</u>

Species Column (1): The species cattle, buffalo, sheep and pig are generally considered for estimating yield rate. If any other species are considered, then that may be specify under 'others'. However, poultry birds are excluded from this column.

Category Columns (2) to (3): The category of the animals in terms of exotic/crossbred/indigenous/non-descript shall be recorded in column (2) and corresponding gender may be recorded in column (3).

Weight before slaughter Column (4): Enumerator shall record weight of the animal before slaughter in kgs.

Quantity of dressed meat obtained (kg.) Column (5): The quantity of dressed meat as observed at the slaughterhouse shall be recorded.

Whether Quantity in col. (5) is within range (Yes/No) Column (6): Enumerator shall confirm whether the quantity of the dressed meat as reported under column (5) is in conformity with the range of yield rate of meat production set by the State Animal Husbandry Department. Accordingly yes or no shall be recorded.

If No in col. (6) confirm Qty. in col. (5) (kg.) Column (7): If the entry in column (6) is 'No' then the enumerator shall confirm the figure recorded under column (5) and the confirmed figure shall be recorded under column (7).

Approx. price of meat/kg. (in Rs.) Column (8): The approximate price of meat/kg. shall be reported for every species.

6.1 Schedule VIII: Details of Broilers and Layers' meat production in the commercial poultry farms

6.1.0 The information for the Commercial Poultry Farms, i.e. a Farm having 1000 poultry birds and more and <u>Government Farms</u> <u>irrespective of their size</u> should be recorded in this schedule. This has to be obtained <u>from all Commercial Poultry Farms</u>. A copy of this Schedule is to be sent to all registered commercial Poultry Farms along with a letter from Managing Director of Poultry Corporation/Animal Husbandry Director, requesting the farm owner to send the desired information on seasonal basis. While requesting for season wise information duration of the season must be clearly indicated in the schedule. In case of continuous non-response, enumerator should personally be deputed to collect the information.

6.1.1 State Animal Husbandry Departments will obtain the season wise information for all the commercial poultry farms in their respective States on (1) number of broiler and layer chicks placed in all the commercial poultry farms,(2) % survival rate of chicks, (3)

Average weigh per bird, (4) dressing % separately for broilers and layers during the year in Schedule VIII in the form of administrative return. They may also take the assistance of hatcheries /poultry farm associations/ supplying agents in the collection of information for the Schedule VIII.

6.1.2 Meat output from broilers in the commercial poultry farms should be estimated by multiplication of (a) number of broiler chick placed in various farms during the season (b) percentage survival rate of chicks (c) average live weight (Kgs) per broiler and (d) dressing percentage. Similarly meat output from layers in the commercial poultry farms should be estimated by multiplication of (a) number of layer chicks placed in various farms during the season (b) percentage of survival of chicks (c) average live weight (Kgs) per layer and (d) dressing percentage.

Chapter Seven

Estimation of Production of Major Livestock Products

7.1 Relative Standard Errors (RSE)

As mentioned in chapter one, for the estimation of livestock numbers, 15% of the villages will be selected *in the form of two independent sub-samples in a State for complete enumeration of livestock and poultry population (5% in each season) by using Simple Random Sampling Without Replacement (SRSWOR).* This would facilitate in calculating **Relative Standard Errors (RSE)** using the simple formula

$$RSE = \frac{Positive\ value\ of\ (\hat{R}_1 - \hat{R}_2)}{\hat{R}_1 + \hat{R}_2} * 100$$

where

$\hat{R}_1$ = Estimates of the character under study from the sub sample of 1

$\hat{R}_2$ = Estimates of the character under study from the sub sample of 2

The estimate of the character under study from combined sample i.e. for sub-sample 1 and 2 together will be simple average of $\hat{R}_1$ and $\hat{R}_2$

7.2 Notations:

T = Total number of districts in the State.
N_h = Total number of villages in the hth district.
n_h =Number of selected villages in the hth district in Sub-sample-1 for complete enumeration of livestock numbers in a season.
v_h = Number of sample villages selected from n_h villages in the hth district for detailed study.
M'_h = Number of animals in milk in the hth district both in rural / urban areas according to the latest Livestock Census.
M'_{hi} = Number of animals in milk in ith village of hth district according to the latest Livestock Census.
M_{shi} = Number of animals in milk as enumerated in the ith village of hth district during sth season as per Schedule -II.
u_{shi} = Number of sample households selected in ith sample village selected for detailed study in the hth district during the sth season.
m_{shij} =Number of animals in milk for which a day's milk yield is recorded from the jth household in the ith village of the hth district during the sth season.
L'_h = Number of layers in hth district both in rural and urban areas according to the latest Livestock Census.
L'_{hi} = Number of layers in ith village of hth district according to the latest Livestock census.

L_{shi} = Number of layers in the ith village of hth district during s[th] season as per Schedule -II
X'_h = Number of sheep (Rams/Ewes/Lambs) in the hth district both rural and urban areas according to the latest Livestock census.
X'_{hi} = Number sheep (Rams/Ewes/Lambs) in i[th] village of the hth district according to the latest Livestock census.
X_{shi} = Number of sheep (Rams/Ewes/Lambs) as enumerated in the ith village of hth district during s[th] season as Village Schedule II
z'_{shi} = Number of animals slaughtered by butchers in the ith village during the sth season in the hth district as per Village Schedule -II
z''_{shi} = Number of animals slaughtered by the households in the ith village during the sth season in the hth district as per Village Schedule -II
y_{smhlk} = Meat production from the kth animal of lth slaughter house of hth district during m[th] month of the sth season.

7.3 Estimates of Milk Production

7.3.1 Estimates of number of Animals in milk in h[th] district in a season.

$$\hat{M}_{sh} = \hat{R}_{sh} * M'_h$$

$$\hat{R}_{sh} = \frac{\sum_{i=1}^{n_h} M_{shi}}{\sum_{i=1}^{n_h} M'_{hi}}$$

7.3.2 Estimation of Average Yield per animal per day in the hth district.

Let y_{shijk} = milk yield of kth animal in the jth household of ith village in h[th] district during the sth season.

Average milk yield per animal per day in the **i[th] village** of the hth district during s[th] season:

$$\overline{y}_{shi} = \frac{\sum_{j=1}^{u_{shi}} \sum_{k=1}^{m_{shij}} y_{shijk}}{\sum_{j=1}^{u_{shi}} m_{shij}}$$

Estimate of Average milk yield per animal per day in **h[th] district** during s[th] season.

$$\overline{y}_{sh} = \frac{\sum_{i=1}^{v_h} M_{shi} * \overline{y}_{shi}}{\sum_{i=1}^{v_h} M_{shi}}$$

7.3.3 Estimate of Total milk production

Estimate of Total milk production per day in the hth district and in the sth season is given by

$$\hat{P}_{sh} = \hat{M}_{sh} * \bar{y}_{sh}$$

7.3.4 Estimate of total milk production per day in a season over all districts is given by

$$\hat{P}_s = \sum_{h=1}^{T} \hat{P}_{sh}$$

7.3.5 An estimate of average milk yield per animal per day pooled over all the districts is given by

$$\bar{y}_s = \frac{\hat{P}_s}{\hat{M}_s} = \frac{\sum_{h=1}^{T} \hat{P}_{sh}}{\sum_{h=1}^{T} \hat{M}_{sh}}$$

7.3.6 Pooling of estimates over the different seasons:

Let $\hat{M}$, $\bar{y}$ and $\hat{P}$ be the estimates of animals in milk ,average milk yield per day per animal in milk animal and total milk production per day in the entire year .

Then $\hat{M} = \sum_{s=1}^{3} Q_s \hat{M}_s$

Q_s is the relative period of season Viz $\dfrac{D_s}{D_y}_s$

Where D_s is number of days in the sth season and D_y is number of days in the yth year and therefore $\sum_{s=1}^{3} Q_s = 1$

$$\hat{P} = \sum_{s=1}^{3} Q_s \hat{P}_s$$

$$\bar{y} = \frac{\sum_{s=1}^{3} \hat{M}_s * \bar{y}_s}{\hat{M}};$$

$$\bar{y} = \frac{\hat{P}}{\hat{M}}$$

7.4 Estimates of egg production
7.4.1 Estimates of number of layers in h^{th} district in a season

$$\hat{L}_{sh} = \hat{R}_{sh} * L'_h$$

$$\hat{R}_{sh} = \frac{\displaystyle\sum_{i=1}^{n_h} L_{shi}}{\displaystyle\sum_{i=1}^{n_h} L'_{hi}}$$

7.4.2 Estimation of Average Egg production per layer per day in the hth district

Let l_{shij} = number of layers on the day of visit in jth household of ith village in hth district during sth season

y_{shij} = number of eggs laid by l_{shij} layers in the j th household of ith village in hth district during the sth season.

Average egg production per layer per day in the **ith village** of the hth district during sth season.

$$\bar{y}_{shi} = \frac{\displaystyle\sum_{j=1}^{u_{shi}} y_{shij}}{\displaystyle\sum_{j=1}^{u_{shi}} l_{shij}}$$

Estimate of Average egg production per layer per day in **hth district** during sth season

$$\bar{y}_{sh} = \frac{\displaystyle\sum_{i=1}^{v_h} L_{shi} * \bar{y}_{shi}}{\displaystyle\sum_{i=1}^{v_h} L_{shi}}$$

7.4.3 Estimate of Total egg production in the hth district

Estimate of Total egg production per day in the hth district in the sth season is given by

$$\hat{P}_{sh} = \hat{L}_{sh} * \bar{y}_{sh}$$

7.4.4 Estimate of total egg production per day in a season over all districts is given by

$$\hat{P}_s = \sum_{h=1}^{T} \hat{P}_{sh}$$

7.4.5 Estimate of average egg production per layer per day pooled over all the districts is given by

$$\bar{y}_s = \frac{\hat{P}_s}{\hat{L}_s} = \frac{\displaystyle\sum_{h=1}^{T} \hat{P}_{sh}}{\displaystyle\sum_{h=1}^{T} \hat{L}_{sh}}$$

7.4.6 Pooling of estimates over the different seasons

Let $\hat{L}$, $\bar{y}$ and $\hat{P}$ be the estimates of number of layers, average egg production per layer per day and total egg production per day in the entire year .

Then $\hat{L} = \sum_{s=1}^{3} Q_s \hat{L}_s$

$$\hat{P} = \sum_{s=1}^{3} Q_s \hat{P}_s$$

$$\bar{y} = \frac{\sum_{s=1}^{3} \hat{L}_s * \bar{y}_s}{\hat{L}};$$

$$\bar{y} = \frac{\hat{P}}{\hat{L}}$$

7.5 Estimates of wool production:

7.5.1 Estimates of sheep (Rams/Ewes/Lambs) population in hth district in a season.

$$\hat{X}_{sh} = \hat{R}_{sh} * X'_h$$

$$\hat{R}_{sh} = \frac{\sum_{i=1}^{n_h} X_{shi}}{\sum_{i=1}^{n_h} X'_{hi}}$$

7.5.2 Estimate of average wool yield per sheep in ith village of hth district during sth season

From each selected flock in a sample of 29 flocks in a selected sample village for detailed study two rams, two ewes and two lambs are selected for recording wool yield in the shearing season.

Let x_{shij} is the number of sheep selected from the jth flock in the ith village, hth district and sth season and f$_{shi}$ is the number of flocks selected in the ith village

y$_{shijk}$ is wool yield from kth sheep in jth flok in ith village of hth district in sth season

$$\bar{y}_{shi} = \frac{\sum_{j=1}^{f_{shi}} \sum_{k=1}^{x_{shij}} y_{shijk}}{\sum_{j=1}^{f_{shi}} x_{shij}}$$

7.5.3 Estimates of wool production in hth district in a season.

The estimate of wool production in ith village of hth district is given by

$$\hat{P}_{shi} = X''_{shi} * \bar{y}_{shi}$$

$X''_{shi} = (\% \text{ Sheep shorn}) * X_{shi}$

Where X''_{shi} is the number of sheep sheared in the i**th** village. This is obtained by

multiplying X_{shi} with percentage of Sheep shorn in the i**th** village $(=\dfrac{\sum\limits_{j=1}^{f_{shi}} b_j}{\sum\limits_{j=1}^{f_{shi}} a_j})$ where b_j is

number of sheep sheared in the jth flock and a_j is number of sheep in the jth flock

Estimate of average wool yield per sheep in the **h**th district in sth season is given by

$$\bar{y}_{sh} = \frac{\sum\limits_{i=1}^{v_h} \hat{P}_{shi}}{\sum\limits_{i=1}^{v_h} X''_{shi}}$$

7.5.4 Estimate of total wool production in hth district in a season is given by

$$\hat{P}_{sh} = \hat{X}''_{sh} * \bar{y}_{sh}$$

Where $\hat{X}''_{sh}$ be the estimated number of Sheep shorn in the hth district during the sth

season and is obtained by multiplying $\hat{X}_{sh}$ with percentage of sheep shorn in the hth

district $(=\dfrac{\sum\limits_{i=1}^{v_h} X''_{shi}}{\sum\limits_{i=1}^{v_h} X_{shi}})$

7.5.5 Estimate of annual wool production in the hth district (added over three seasons)

$$\hat{P}_h = \sum_{s=1}^{3} \hat{P}_{sh}$$

7.5.6 Estimate of annual wool yield per sheep (added over three seasons) in the hth district

$$\bar{y}_h = \sum_{s=1}^{3} \bar{y}_{sh}$$

7.5.7 Estimates of number of sheep shorn in hth district in a year

$$\hat{X}''_h = \frac{\hat{P}_h}{\bar{y}_h}$$

7.5.8 Estimated total wool production (P^*_{sh}) in the hth district during the sth season is obtained by adding the estimated wool production for rams, ewes and lambs.

The estimated total wool production in the State during the sth season is given by

$$P_S^* = \sum_{h=1}^{T} P_{sh}^*$$

7.5.8 Estimate of average wool yield per sheep in the entire State during s^th season

$$\bar{y}_s = \frac{\sum\limits_{h=1}^{T} \hat{P}_{sh}}{\sum\limits_{h=1}^{T} \hat{X}_{sh}''}$$

7.6 Estimates of Meat production (excluding poultry)

The procedure of estimating:
1. the total number of animals slaughtered;
2. the average meat production per animal and
3. the total meat production are discussed in the following paragraphs:

The data on the number of animals slaughtered is obtained from two sources.
- i) from the sample of households reporting slaughter of animals and from all the butchers and other agencies in the villages selected in the sample and
- ii) from records maintained at all the slaughter houses in the state.

7.6.1 Approximate Number of Animals Slaughtered:

(i) Estimated number of animals slaughtered by butchers and the households in a season is given by:-

$$\hat{Z}_{sp} = \sum_{h=1}^{T} \frac{N_h}{n_h} * \sum_{h=1}^{n_h} Z_{shi}$$

Where Z_{shi} is the total number of animals slaughtered in the ith sample village and is given by

$$Z_{shi} = z'_{shi} + z''_{shi}$$

(ii) Number of animals slaughtered in registered slaughter houses:

Let $\hat{Z}_{sr}$ be the total number of animals slaughtered in all the registered slaughter houses of the State during the sth season.

(iii) Estimate of total number of animals slaughtered in the State during the sth season is given by :

$$\hat{Z}_s = \hat{Z}_{sp} + \hat{Z}_{sr}$$

(iv) Estimate of total number of animal slaughtered in the State during the year is given by :

$$\hat{Z} = \sum_{S=1}^{3} \hat{Z}_s$$

7.6.2 Estimate of Average Meat Production per animal

The average meat production per animal in the lth slaughter house of the hth district during the mth month of the sth season is given by:

$$\bar{y}_{smhl} = \frac{1}{3}\sum_{k=1}^{3} y_{smhlk} \text{ (as 3 animals selected in each month)}$$

Let Z_{smhl} be the number of animals slaughtered in the lth slaughter house of the hth district during m^{th} month of sth season.

The estimate of meat production in a month in the lth slaughter house of the hth district is

$$P_{smhl} = \bar{y}_{smhlk} * Z_{smhl}$$

(i) The estimated of average meat production from an animal in the sth season in the State is given by :-

$$\bar{y}_s = \frac{\sum_{h=1}^{T}\sum_{m=1}^{ds}\sum_{l=1}^{u} P_{smhl}}{\sum_{h=1}^{T}\sum_{m=1}^{ds}\sum_{l=1}^{u} Z_{smhl}}$$

ds is the number of months in the sth season, which is equal to 4 for all s
U_h = Number of registered slaughter houses in the hth district
u is the number of registered slaughter houses selected out of U_h in the sth season.

(ii) The estimate of average meat production from an animal in the State is given by :

$$\bar{y} = \frac{\sum_{S=1}^{3}\hat{Z}_s * \bar{y}_s}{\sum_{S=1}^{3}\hat{Z}_s} = \frac{\hat{P}}{\hat{Z}}$$

7.6.3 Estimate of Total Meat Production in the State:

Estimate of total meat production in a state is obtained by multiplying the estimated number of animals slaughtered in the sth season in a state with the average meat production per animal in the sth season and added over the differed seasons and is given by :-

$$\hat{P} = \sum_{S=1}^{3}\hat{Z}_s * \bar{y}_s$$

7.7 Method of estimating feed consumption per animal per day on the basis of data collected in block- 5 of schedule-III

7.7.0 Season wise Village level estimate of average feed consumption will be calculated as simple average of feed consumption by the animals in the selected household.

7.7.1 Season wise District level estimate of average feed consumption will be calculated as **weighted average of village level estimates, weight being the number of animals in the village as per latest livestock census**.

7.7.2 Season wise, State level estimate of average feed consumption will be calculated as weighted average of district level estimates, weight being the number of animals in the district as per latest livestock census.

7.7.3 Annual State level estimate of average feed consumption will be calculated as weighted average of season wise estimates, weight (Q_s) being the relative period of season Viz D_s/ D_y, where D_s is number of days in the sth season and Dy is number of days in the year and therefore

$$\sum{}^3_{s=1} Q_s =1$$

7.7.4 The estimates will be prepared category wise (crossbred cattle/indigenous cattle/ buffalo) and separately for adult male, adult female and young stock.