

1. SCOPE AND OPPORTUNITIES IN ANIMAL HUSBANDRY

Can you recall ?

1. Different sources of Indian economy
2. Status of Livestock during “Mahabharata”
3. What do you mean by Animal Husbandry?
4. Intergrated Livestock Farming



India is basically an agricultural country having the primary source of livelihood for 54.6 per cent of India's population and contributes 17.4 per cent to the country's total Gross Domestic Product (GDP). Livestock is an integral part of Agriculture, in fact the Indian economy is closely knit with agriculture and livestock and both are crucial for overall food security. Now a day's agriculture sector is undergoing a historic change as livestock has surpassed the economy of food grain and today finally the policy makers of country recognized livestock as the engine of agriculture growth.

Remember...

Livestock sector contributes country's 4.11 % of GDP and 25.67 % of total agriculture GDP.



Besides providing cheap and nutritious food to millions of people, animal husbandry is playing a significant role in generating gainful employment in the rural areas, particularly among the landless, small and marginal farmers and women. According to National Survey Scheme (NSS, 2013), 23 per cent agricultural households 16.44 million workers are engaged in the activities of farming of animals. Employment in livestock sector is fast catching and has implications for poverty too. It has been observed that rural poverty is less in states where livestock contributes more to farm income.

India is basically an agricultural country and it is likely to be so, in future to come. At present 54.6 per cent of Indians depend on agriculture for their livelihood. Out of the total land holding 30 per cent is held by small and marginal farmers. They manage 80 per cent of total livestock in the country. Livestock production is more impressive than that of food grain production. The activity of livestock production is largely confined to the rural sector as land, labour, capital and organization are the basic resources available in the rural sector. These four factors of livestock production are roped in proportionately to augment the production of finished goods; namely milk, meat, pork, wool and related multifarious products of commercial importance. These products follow their regular path-ways of processing, preservation, pricing and quality control. The age-old format of conventional dairy management is being transformed into a more meaningful and scientific form, based on improved breeding, feeding, heeding, housing and health cover practices. Apart from milk, meat, eggs, wool and leather, various animal species are also used for draught power, companionship, entertainment, research experimentation, sports, security etc. Fortunately, India has blessed with tremendous livestock wealth, both in terms of number as well as diversity. This is endeavored with the complexity to sustain under harsh climatic conditions with scarce resources.

Do you know ?

India has the largest cattle population in the world.



Livestock plays an important role in Indian economy. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16 per cent to the income of small farm households as against an average of 14 per cent for all rural households.

Internet my friend

Collect information on different livestock products.



1.1 PRESENT POSITION OF LIVESTOCK AND POULTRY IN INDIA AND WORLD

Can you tell ?

1. Current Total Livestock and poultry breeds in India
2. Different livestock species found in India



Livestock comprising mainly cattle, buffaloes, sheep and goats have a complementary, supplementary, symbiotic and sustainable relationship with crop production under mixed farming system prevalent in our country. India has a distinguished livestock heritage and a place of pride in the history of livestock development in the world. It has shared its livestock resources with many countries all over world, thus contributing immensely in livestock development on a global scale.

India has the largest number of breeds of livestock and poultry in the World. After 15 new breeds of livestock and poultry registered with NBAGR (National Bureau of Animal Genetic Resources, Karnal) on 5th September, 2018, now India has total of 184 breeds of livestock and poultry. Among these we have 43 cattle, 16 buffalo, 34 goat, 44 sheep and 9 chicken breeds. One-seventh of all cattle breeds, nearly all buffalo breeds, one-third of the goat breeds and one-sixth of sheep breeds of the world are in India. Our zebu cattle are much prized for their hardiness, ability to digest coarse fibers, heat tolerance, disease resistance and adaptability to harsh tropical climatic conditions. Indian game fowl (Aseel) is reported to have contributed to the emergence of modern broiler breeds. Likewise, the Red Indian Jungle fowl has been used for evolution of modern laying birds.

As per 19th Livestock Census (2012) India is holding 11.60 percent of World's livestock population, consisting 57.83 percent buffaloes, 15.06 percent cattle, 17.93 percent goats and 7.14 percent sheep. India ranks first in the world in respect of buffalo and cattle while second in goat population and third in sheep population. However, the total livestock population of India decreased by about 3.33 per cent in 2012 census over the previous 2007 census. The cattle population in the 19th census decreased by 4.10 per cent, sheep by 9.07 percent, goat by 3.82 percent and pigs by 7.54 percent while buffalo population increased by 3.19 percent and poultry by 12.39 percent over the previous 2007 census. In India Uttar Pradesh is ranking first in buffalo population and the total livestock population while Andhra Pradesh ranks first in sheep and total poultry population.

Do you know ?

1. India is having highest livestock population in the world
2. First in cattle & buffalo population
3. Second in goat population
4. Third in sheep population
5. Fifth in poultry population



India has 729.20 million poultry resulted in 12.39 per cent growth over the previous census. Poultry in India developed very fast in Andhra Pradesh, Tamil Nadu, West Bengal, Karnataka, Assam and Jharkhand. The buffalo population in Maharashtra decreased from 6.94 million in 2007 to 5.59 million in 2012 and cattle population also decreased from 16.18 million in 2007 to 15.48 million in 2012. The sheep and goat population also decreased from 2.91 and 10.39 million in 2007 to 2.58 and 8.43 million in 2012, respectively. Only the poultry population has been tremendously increased from 16.27 million in 2007 to 77.80 million in 2012 showing nearly 5 times growth.

Table 1.1 : Livestock and Poultry population (19th Livestock census-2012)

Sr. No.	Species	India			Maharashtra		
		Population (Millions)	Per cent of World	Rank in World	Population (Millions)	Per cent of India	Rank in India
1.	Cattle	190.90	12.5	First	15.48	8.11	Fourth
2.	Buffalo	108.70	56.7	First	5.59	5.14	Eighth
3.	Sheep	65.10	20.4	Third	2.58	3.96	
4.	Goats	135.20		Second	8.43	6.23	
5.	Pigs	10.30	--	--	0.33	3.20	--
6.	Poultry	729.20	3.1	Fifth	77.80	10.67	Third

Source: Annual Report 2017-18, DAHDF, GOI

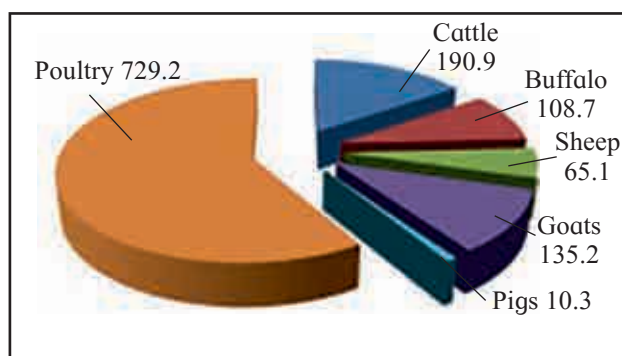


Fig. 1.1: Livestock and Poultry population in millions (19th Livestock census-2012)

Can you tell ?

Different milk products manufactured in your area.



1.2 SCOPE AND LIMITATIONS FOR LIVESTOCK AND POULTRY FARMING IN INDIA

Livestock is an integral component of agriculture. It makes multifarious contributions to the growth and development of the agricultural sector. Though the GDP of agriculture has shown a declining trend during recent decades, it has a large scope to sort-out the causes of lacunae and correct them. Livestock helps to improve food production and provide nutritional security. It generates income, employment and act as a cushion against crop failure. It provides

draft power and manure inputs to raise the crop. It also contributes to foreign exchange through the export of animal products. By using crop residues as feed, livestock saves land for food production that would otherwise be used for fodder production. Additionally, livestock contributes to environment conservation, supplies draft power, manure and domestic fuel that saves the use of petro-products.

Remember...

Livestock also contributes in saving fuel/petrol products.



The contribution of agriculture sector to the total GDP in 1950-51 was 50.50 per cent of which the share of Animal husbandry was 15.50 per cent. From 1980-81 to 2008-09 period the contribution of agricultural sector fell from 46.40 to 17.20 per cent, while the contribution of Animal Husbandry as per cent of agriculture went up from 18.63 in 1980-81 to 25.60 in 2017-18 which speaks about potential of Animal Husbandry sector to boost the national economy. The contribution of livestock sector to the total GDP was 4.11 per cent in 2017-18.

As per the Annual Report (2017-18) published by the Department of Animal Husbandry, Dairying and Fisheries, Government of India, Annual production and per capita availability of livestock products are shown in Table 1.2

Table 1.2 : Annual production and per capita availability of Livestock products during 2016-17.

Sr. No.	Livestock Product	Annual production	Per capita availability	ICMR recommendation
1.	Milk	165.4 MMT	355 gm/day	280 gm/day
2.	Meat	7.4 MMT	2.96 kg/year	11 kg/year
3.	Eggs	88.1 billion	69 eggs/year	182 eggs/year

Source: Basic Animal Husbandry Statistics, 2017 DAHDF, GOI

India contributes 2.80 per cent of the total meat production of the world (212.31 MMT). The share of beef, buffalo meat, mutton, goat meat, pork and poultry meat in India was 4.62, 19.83, 7.60, 14.22, 6.41 and 47.32 per cent, respectively against the total meat production of 7.4 million metric tonnes in the Country.

Internet my friend

1. Current per capita availability of milk, meat and eggs in India.
2. Recommended per capita requirement of milk, meat and eggs in India.
3. Current Annual Milk production in India and Maharashtra

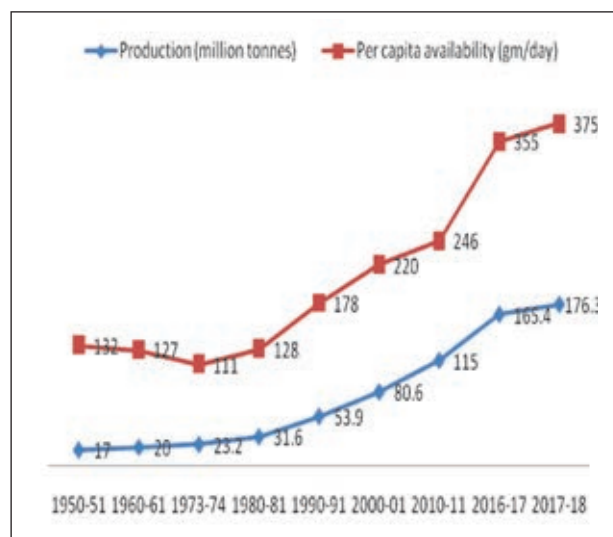


Fig.1.2: Annual milk production and per capita availability

Table 1.3 : Annual milk production and per capita availability from 1950-2017.

Financial Year	Production (million tonnes)	Per capita availability (gm/day)
1950-51	17.00	132
1960-61	20.00	127
1973-74	23.20	111
1980-81	31.60	128
1990-91	53.90	178
2000-01	80.60	220
2010-11	115.00	246
2016-17	165.40	355
2017-18	176.30	375

India ranks first in the world with annual milk production of 176.30 million tones (2017-2018). The share of cow, buffalo and goat milk is 47.3, 49.2 and 3.5 percent, respectively. Uttar Pradesh produces maximum milk followed by Rajasthan, Andhra Pradesh, Gujarat and Punjab. Tamil Nadu produces highest crossbred cow milk followed by Maharashtra while Uttar Pradesh produces highest milk from Indigenous/ Deshi cows followed by Rajasthan. In case of buffalo milk, Uttar Pradesh is largest producer followed by Andhra Pradesh, Rajasthan, Punjab, Haryana, Gujarat, Madhya Pradesh and Maharashtra. Uttar Pradesh also produces highest Goat milk followed by Rajasthan. The per capita availability of milk is increased from 132 gm in 1950-51 to 375 gm in 2017-18. Per capita per day milk recommended by ICMR is 280 gm.

Do you know ?

1. **Uttar Pradesh is the largest milk producer state in India**
2. **Tamil Nadu is the largest crossbreed cow milk producer in India**
3. **Maharashtra is the second largest crossbreed cow milk producer in India**

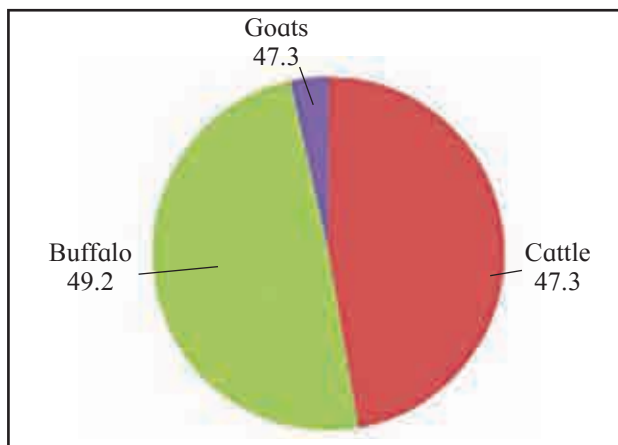


Fig.1.3: Species wise per cent milk production in India (2017-2018)

The egg production in India has also been significantly increased from 53.6 billion in 2007-08 to 88.14 billion during 2016-17 with per capita availability of 69 eggs as against 47 egg in 2007-08. Andhra Pradesh is largest egg producer, followed by Tamil Nadu, West Bengal, Maharashtra and Haryana. Meat production in 2007-08 was 4 million tonnes, which increased to 7.4 million tonnes during 2016-17. Poultry contributes 47.32 per cent of the total meat production in India, followed by buffalo and goat meat. Uttar Pradesh produces highest meat followed by Andhra Pradesh, West Bengal, Maharashtra and Tamil Nadu

Remember...

1. **Andhra Pradesh is the largest eggs producer state in India.**
2. **Uttar Pradesh is the largest meat producer state in India.**
3. **Poultry contributes 47.32 per cent of total meat production in India.**



Wool production in India is showing declining trend. In 2006-07 it was 45.1 million Kg which marginally declined to 44.7 million Kg during 2011-12. Wool production was increased to 48.1 million Kg during 2014-15 which is again decreased to 43.5 million Kg during 2016-17. Wool production is maximum in the state of Rajasthan followed by Karnataka, Jammu & Kashmir, Andhra Pradesh and Gujarat.

Upliftment of Farmer's economy

Livestock plays an important role in upliftment of farmer's economy by number of ways. Farmers in India do the mixed farming i.e. combination of crop and livestock where the output of one enterprise becomes the input of another enterprise. Livestock keeping contributes to farmer's economy by following different ways...

1. **Income:** Livestock is a source of subsidiary income to many farmer's family especially poor or marginal farmers as sale of cow and buffalo milk provides regular and guaranteed income flow. Income from the sale of milk acts like ATM to farmers. Animals like sheep and goat serve as a source of income during emergencies like marriage, children's education, health cover or family and livestock, repair of house etc. Therefore, livestock acts as a secure source of income to farmers.

Do you know ?

Income from the sale of milk acts like ATM to farmers.

Sheep and goat serve as a source of income during emergencies like marriage, education, ill health, repair of house.



2. **Food security:** The different livestock products such as milk, eggs and meat serve as an important source of animal protein to human beings.
3. **Social Security:** The livestock keeping offers a social security to the owners in terms of status in the society. In the Mahabharata era there was a special

status to the Princes as those who hold more number of animals were said to be the richest Prince (Raja). The families especially the landless which own animals are better placed than those who do not. Gifting animals in marriages is a very common in different parts of country. Also animals are used for various socio-religious functions. Cows are worshiped during various religious functions.

4. **Draft:** Bullocks are the backbone of Indian agriculture. Many farmers especially marginal and small depends upon bullocks for different agricultural operations such as ploughing, carting and transport of various agriculture inputs and outputs.

Do you know ?

Uses of dung and urine of livestock



5. **Dung:** In rural areas dung is used as rich fertilizer, an efficient fuel and biogas producer. It acts as poor man's cement as it is used as plastering material for their houses. It is also used for flooring in and outside the farmer's houses and animal houses.
6. **Employment:** Many people depend on agriculture for their livelihood, but agriculture being a seasonal, provides only 180 days employment. The landless and marginal farmers depend upon livestock for utilizing their labour during lean season of agriculture. Thus livestock has enormous power to generate employment throughout the year.

Limitations for improvement of livestock and poultry farming in India

1. Inadequate feed and nutrition to support our vast livestock and poultry population.
2. Low genetic potentiality for high production due to the absence of selection for milk, meat, eggs and wool.

3. Poor organization of breeding programme for livestock.
4. Lack of efficient and scientific management.
5. Lack of uniformity in collection of data.
6. Poor adoption of modern techniques to control diseases.
7. In poultry farming, increasing prices of feed ingredients, lack of poultry export, lack of financial support and inadequate extension services.

Can you tell ?

- Major limitations in livestock farming in India.
- The nutritive value of milk, meat and eggs.



1.3 NUTRITIVE VALUE OF ANIMAL PRODUCTS

Milk is considered as complete food for human being. Cow milk contains fat (4.90%), protein (3.90%), lactose (5.10%), ash (0.80%), total solids (14.70%) with vitamins and minerals.

Meat is very good source of phosphorous, iron and protein with well balanced essential amino acids, and has protein 21 per cent, fat 6 per cent, minerals 1 per cent and water 72 per cent. It contains Cu, Zn, Na, K, Mg and low amount of Ca.

Remember...

The poultry is considered as the most economical and fastest way of supplying animal protein for human consumption.



Poultry meat has high nutritive value. Chicken meat contains high protein with almost all essential amino acids. It is low in calories. It is very good source of Vitamin B-complex and minerals like iron and phosphorus.

Egg is an important well balanced source of nutrients containing proteins, unsaturated fatty

acids, minerals especially iron, phosphorous and almost all the vitamins with the exception of Vit C. It's high nutrient content, low calorific value and easy digestibility make it a valuable protective food in human diet.

1.4 INTEGRATED LIVESTOCK FARMING

Integrated livestock farming plays an important role in India. The increasing human population in the India is warranting more production of food and milk from the limited area and productive livestock. Various enterprises that could be included in the integrated livestock farming system are crops, dairy, poultry, goat rearing, fishery, sericulture, agro-forestry, horticulture, mushroom cultivation etc. The knowledge of linkages and complementarities will help to develop integrated livestock farming in which the waste of one enterprise is more efficiently used as an input in another within the system.

Example :

- Crop + Livestock + Poultry.
- Crop + Fish + Poultry + Duck
- Crop + Dairy + Goat + Sheep.

Internet my friend

Search for medicinal uses of cow urine for human health



1.5 COMMON TERMS USED IN ANIMAL HUSBANDRY AND POULTRY

1. **Adaptation** : Adjustment of an individual's or group of individuals' genotypes to the changed environmental situation.
2. **Albinism** : Absence of pigments in the hair and skin.
3. **Animal**: The word includes the various organisms belonging to the kingdom Animalia
4. **Animal Husbandry**: It is an art of management including scientific feeding, breeding, housing and health care of domestic animals.
5. **Anterior** : Front or forward part of the body.
6. **Breed** : Animals which have a common origin and so the common characteristics which are distinguished from other group of animals within the same species and the characters are inherited in the progeny.
7. **Breeding** : It is the manipulation of hereditary material in accordance to the terms of demand dictates.
8. **Broiler** : The hybrid chicks having rapid growth and attaining 1.50 kg weight during the period of 6 weeks of age and sold for table purpose up to 8 weeks.
9. **Calf** : Young one of cattle or buffalo below the age of six months.
10. **Calving Interval** : The period between two successive calvings.
11. **Castration** : Act of crushing the spermatic cord by Burdizzo's castrator.
12. **Chick** : A young male or female fowl below 6 weeks of age.
13. **Conception** : The successful union of male and female gametes to form a zygote and implantation of zygote is known as conception. It is an act of becoming pregnant.
14. **Digestion** : The term digestion refers to all the changes a food undergoes in the alimentary canal and makes the nutrients absorbable for the use by the body.
15. **Domestic animal** : The animals which are reared on farm and farm premises.
16. **Dorsal** : It refers to the back or back portion of an animal.
17. **Dry matter** : It refers to that fraction of food which doesn't contain moisture

- higher than 10 per cent and is composed of the nutrients.
18. **Dry period** : The period after lactation during which the animal does not produce milk.
 19. **Fertility** : It refers to the ability to reproduce.
 20. **Flock** : It is the group of sheep, goat or poultry birds.
 21. **Foetus** : Developing individual in intra-uterine life when the body parts are formed before birth.
 22. **Gait** : The forward posture and motion or style of a animal.
 23. **Gene** : It is the unit of inheritance, which is transmitted in gametes or reproductive cells. It is the physical basis of heredity.
 24. **Genotype** : The actual genetic make-up of an individual as determined by the genes it carries.
 25. **Germplasm** : The material on the basis of heredity taken collectively. The sum of gene constitution of an individual.
 26. **Gestation** : The period of pregnancy.
 27. **Heifer** : The younger female of cattle above six months of age to first calving.
 28. **Herd** : It is a group of cattle or buffalo.
 29. **Heridity** : The occurrence of genetic factors derived from each of its parent in an Individual.
 30. **Heritability** : The percentage of variation in individual characteristics between related individuals which is due to true genetic difference.
 31. **Hybrid** : The progeny of parents that are genetically different from two pure lines.
 32. **Inheritance** : Transmission of genetic factors from parents to offspring's.
 33. **In-utero** : Within the uterus.
 34. **In-vivo** : Within the living body.
 35. **In-vitro** : Within an artificial environment.
 36. **Lactation period** : The period from parturition to the day of drying in which the animal produces milk.
 37. **Layer** : An egg laying female chicken upto one year.
 38. **Libido** : Sexual desire or sexual drive.
 39. **Livestock** : The term livestock in broad sense can be defined as all the animals, birds and other living creatures used for producing products for the use of man.
Livestock in narrow sense is loosely used to include the (mammal) farm animals.
 40. **Offspring** : Youngone of both the sexes produced by the parents.
 41. **Oogenesis** : Formation of ova.
 42. **Ovulation** : A process of release of ova or egg from matured Graffian follicle.
 43. **Pedigree** : It is record or history of ancestors of an individual.
 44. **Phenotype** : The external appearance or performance of an individual which are determined by genes and are observable by eye.
 45. **Poultry** : The term poultry includes a number of avian species such as chicken, duck, turkey, geese, guinea fowl and quails domesticated for economic purpose.
 46. **Progeny** : The young offspring of the parents.
 47. **Prolificacy** : Ability of giving birth to many or few offsprings from a given mating.
 48. **Puberty** : It is the stage in the life of animal indicating first sexual activity.
 49. **Service** : The process in which mature male covers the female in heat with the aim to deposit the spermatozoa in the female genitalia.
 50. **Sire** : The male parent of an individual.

51. **Species** : A group of individuals which have certain common characteristics that distinguish them from other group of individuals within a genera of genus.
52. **Sterility** : Inability to produce any offspring.
53. **Succulent feeds** : Greens/forages harvested in full bloom stage which are soft, and contain large amount of moisture. They carry easily digestible nutrients and are rich in vitamins, mineral and digestible carbohydrates and proteins.
54. **Teaser** : A vasectomized (castrated) bull used to detect the heat or estrus of female (cow).
55. **Trait** : It means a specific character.
56. **Zygote** : It is a fertilized ovum.

EXERCISES

Q.1 Fill in the blanks.

- Livestock contributes % to the country's total Gross Domestic Products.
- India has million poultry population.
- The act of crushing the spermatoc cord by Burdizzo's castrator is known as
- Egg of poultry contains almost all the vitamins with the exception of Vit.
- Buffalo population of Maharashtra in 2012 was millions.
- ICMR recommended per capita availability of meat per year is Kg.

Q.2 Match the pairs.

Group A		Group B	
1)	Heifer	a)	Cow
2)	Milk	b)	Male parent
3)	Eggs	c)	Young female
4)	Sire	d)	Female parent
5)	Chicken	e)	Layer poultry
		f)	Broiler poultry

Q.3 Identify the odd one out.

- Milk, Meat, Poultry, Egg
- Cattle, Buffalo, Sheep, Pig.
- Dung, Meat, Milk, Egg.

Q.4 Answer the following questions in brief.

- What is integrated livestock farming?
- Write the nutritive value of milk.
- Write limitations of poultry farming.
- Give the meaning of livestock.
- What is mean by Animal husbandry?

Q.5 Answer the following in detail.

- Describe the importance of livestock in India.
- Explain present status and scope of livestock.