Issues and Indicators of Meat Sector in India

B. M. Naveena*, M. Muthukumar and Rituparna Banerjee

ICAR- National Research Centre on Meat, Chengicherla, Hyderabad -500092

ABSTRACT

State-of-the-art technological interventions has resulted in transformation of unorganized and unscientific chicken farming practice in India to a highly successful commercial production system. Production and processing of milk in India has also seen a quantum leap in the last decade. However, few successful models observed in certain livestock/poultry commodities could not be replicated in other areas. Hence, identification of potential commodities and their commercial exploitation will pave the way for doubling farmer's income. Effective interventions like reducing the mortality rate, better biosecurity, creation of disease free zones, minimizing the post-harvest losses, linking small producers to market, increased value addition and further processing, exploiting natural, organic, minimally processed, seasonal, fresh and locally grown sentiments will augment the farmer's income. Assistance to farmers/farms to build production model in line with global GAP for ensuring safe, nutritious, traceable and affordable products to consumers.

Keywords: *Livestock Value Chain, Indian Meat Sector, Meat Processing, Post-harvest Losses, Meat Export*

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INTRODUCTION

Livestock plays an important role in Indian economy and provides livelihood to two-thirds of rural community. Livestock and poultry including cattle, water buffalo, sheep, goat, pig and chicken are primarily produced by the masses for milk, meat, egg, draught power and biomass. Few other species viz, yak, mithun, camel, rabbit, duck, emu, Japanese quail, kadaknath etc. are also produced in some parts of India as livelihood activities. India has around 42 sheep breeds, 26 goat breeds, 13 buffalo breeds, 40 cattle breeds, 6 pig breeds and 17 chicken breeds registered with Indian Council of Agricultural Research-National Bureau of Animal Genetic Resources (ICAR-NBAGR). India has a huge livestock wealth and ranks 1st, 2nd, 2nd and 4th in the world for water buffalo, cattle, goat and sheep population, respectively during the year 2016 (FAOSTAT). In the year 2017-18, India has produced 7.7million tonnes of meat and has the distinction of producing largest amount of buffalo meat in the world (42.15%). It is also a 2nd largest producer of goat meat in the world. Per capita consumption of meat in India still remains relatively low at less than 6.5 kg/person/annum.

Meat sector activities includes live animal transport, marketing, slaughtering of animals, processing, value addition, by-products utilization, disposal of solid and liquid waste, distribution and retailing of meat and offals. India has around 4000 registered slaughterhouses maintained by local bodies where animals are slaughtered for domestic consumption. Slaughtering is performed in designated abattoirs or slaughterhouses and most of the meat is consumed on the same day or kept in a refrigerator in the households. The meat produced for the domestic market is sold as hot meat (pre-rigor meat without any chilling). Food Safety and Standards Authority of India (FSSAI) under Food safety and standards act, 2006 ensures production of hygienic meat for domestic consumption. An overview of species-wise meat sector contribution in India is presented below.

BUFFALO MEAT SECTOR

Majority of the Meat science literature in India mention that only 2.0% of the total meat undergoes processing and value addition. However, presently more than 21% of the total meat produced in India (7.7million tonnes) undergoes processing and value addition. This is mainly because of buffalo meat in which around 90% of total buffalo meat produced in India (~1.5 MT) undergoes chilling, packaging, freezing and branding and then exported. Most of the buffalo meat is processed at around 82 state-of-the art export slaughterhouses approved under APEDA. These processing plants have all the facilities for solid and liquid waste management and convert all the inedible waste and by-products into meat and bone meal, meat meal, blood meal or fertilizer using rendering or composting technique. Hence, wastage from buffalo meat sector in India is limited. Total leather and leather good export from India stood at US$ 4.72 billion during April 2016 to January 2017 (Council for Leather Exports). Around 3500 companies are manufacturing or exporting leather and leather products are members of CLE. Around 40% of the leather produced and exported from India comes from buffaloes, whereas, 30% comes from goats. Buffalo meat exports (1.35 MT) from India has contributed Rs. 26,033=00 crores during the year 2017-18.

SHEEP AND GOAT MEAT SECTOR

Sheep and goat sector contributed Rs. 32,000 crore to the gross domestic produce of India in 2013-12 and has the potential to contribute over Rs. 1,50,000 crore. Sheep and goat meat are premium meats in India sold at more than Rs. 400-500 per kg across the country. Most of the edible offal or by-products produced from sheep and goat are also marketed and consumed in India. Hence, the wastage from this sector is minimal. However, major chunk of the sheep and goat meat in India is produced in domestic slaughterhouses which are in very poor condition and realisation from in-edible by-products is very less. Organised slaughtering in sheep and goat sector will improve the returns to farmers.

POULTRY MEAT SECTOR

The poultry Industry in India is a Rs. 1,00,000 crores sector. The 75% of poultry sector (breeding, feeding, hatcheries and broiler farming) in India is organised with complete integration, however, remaining 25% including slaughtering, distribution and retailing is unorganised with predominantly wet market business. This also includes microeconomic activity for sustainability in rural areas.

* Corresponding author E-mail address: Naveena.BM@icar.gov.in

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The 11% of poultry meat is produced in India from more than 21 large (>1000 birds/hour capacity) and around 20 smaller (<1000 BPH) poultry processing plants. This means almost 90% of the poultry meat in India is produced under wet market conditions through highly scattered road side poultry processing plants. This is resulting in inefficient utilization of all poultry by-products and disposal problems. However, no meat or edible by-products is wasted either at retail or consumer level. Most of the loss in poultry value chain is happening during transportation of live birds (pre-harvest) due to transportation loss, injuries and death of birds. To some extent loss may happen at restaurants/hotels or in functions where buffet lunch/dinner is served.

PIG MEAT SECTOR

Among the various livestock species, piggery is the most potential source of meat production and more efficient feed converters after the broiler. Apart from providing meat, it is also a source of bristles and manure. Around 150 meat processing plants which are mainly processing pork and pork products like sausages, bacon and ham are functioning on small scale in the private sector in India. Most of the production and processing activities are under unorganized sector. As per the reports there are 25,000 pig farmers in Telangana state with 10-500 animals in each. Punjab has around 400 pig farmers with an average farm size of 50-200 each. Pig producers cooperative federations are coming up in some of the States. India has several indigenous and exotic pig breeds. The commonly used exotic pig breeds in India are Large white Yorkshire, Hampshire, Landrace, Large black and Duroc either pure or their crosses. Besides these exotic pig breeds, the indigenous pig breed, Ghungroo is also available in few states of North East. The total requirement of pork in India would be around 0.93 million tonnes against the present pork production of 0.395 million tonnes. Thus the present shortfall of pork in the country is about 0.60 million tonnes. Pork production and processing can be a profitable enterprise for nutritional security and meeting employment generation requirement of ever increasing population.

POST-HARVEST LOSSES IN LIVESTOCK PRODUCE

Assessment of quantum of harvest and post-harvest losses in any food sector is of paramount importance for the economy of the country. The apt terminology for meat sector would be "pre-slaughter losses", "slaughter losses" and "post-slaughter losses". Studies conducted at Indian Veterinary Research Institute under National Agricultural Technology Project revealed higher pre-slaughter losses (injuries, illness and death) in sheep and goat (10-12%) relative to buffaloes (4-5%). The slaughter losses (condemnation of meat and by-products) remains negligible (<0.5%) for buffalo, sheep and goat and pig meat. Higher post-slaughter losses (transportation, storage, preparation and serving) mainly comprising by-products were observed in buffaloes compared to sheep, goat and pigs. All India Coordinated Research Project (AICRP) on Post-harvest Technology (PHT) estimated total losses in meat and poultry sector to be 2.3 and 3.7% accounting for Rs. 235 crores and 104 crores, respectively. Losses comprising all materials routinely discarded during slaughter, dressing and by-products processing operations have potential for revenue generation, if organised collection and processing into value added products are carried out. In general, losses in meat sector were higher in *kharif* and zaid seasons than in *rabi*. According to a report by Jha *et al.* (2015) extent of post-harvest losses in livestock produce in the year 2012-13 is estimated around Rs. 18,987 crores. Poultry meat accounts for 21% of the total loss accounting for Rs. 3,987 crores. Quantitative and qualitative loss happening through livestock value chain at different steps is mentioned below.

Quantifying postharvest losses

I. ***Pre-slaughter loss:*** From the point of purchase of animals-transportation shrinkage, injury, lairage conditions, diseases, death etc.
   a. Farmer level:
      - Death of animals
      - Disease scare situation
      - Seasonal losses (summer /holy months)
   b. Animal trader level:
      - Death of animals during transit
      - Live animal weight loss
      - Injuries

II. ***Slaughter loss:*** Condemned carcasses, removal of affected parts, trimmings, byproducts etc.
   - Skin damage due to faulty flaying and handling
   - Meat loss due to fracture and bruise
   - Meat loss due to contamination
   - Disease and defects

III. ***Post-slaughter loss:*** Transportation loss, loss at retail shops, packaging and further processing, loss at consumer level, spoilage etc.

a. Meat trader/Processor level
   - Weight loss due to storage (chiller loss, evaporative loss)
   - Processing loss (connective tissue, cooking loss)
   - Spoilage
   - Unsold meat

b. Consumer level: Household/Hotels and Restaurants/Mess/Canteens
   - Spoilage

Losses in quality

- Buffalo meat exported from India is produced from millions of spent, female buffaloes after completion of their milk production period. Hence, buffalo meat produced in India is a by-product of the dairy Industry and fetches low price of 2500 to 3000 USD/tonne relative to meat from developed countries. If male buffalo calves can be reared till 200-250 kg body weight through better integration, backward linkages and Government schemes, this meat will fetch higher price in International market.
- Only deboned, frozen buffalo meat is being exported from India. Value addition and further processing and export of processed buffalo meat products will increase the profit margins.
- Lack of specific meat breeds, absence of disease free zones, shortage of hygienic and modern slaughterhouses are resulting in qualitative loss.

PROCESSING LEVEL IN DIFFERENT COMMODITIES IN INDIA

Sale of fresh meat may yield 4-5% margin, however, processing into value added meat products will result in 15-20% profit margin for meat processors. It has been estimated that about 7 - 15 % of the gross income come from the byproducts utilization for all meat processors. The level of further processing and value addition in different commodities is mentioned in Figure1.

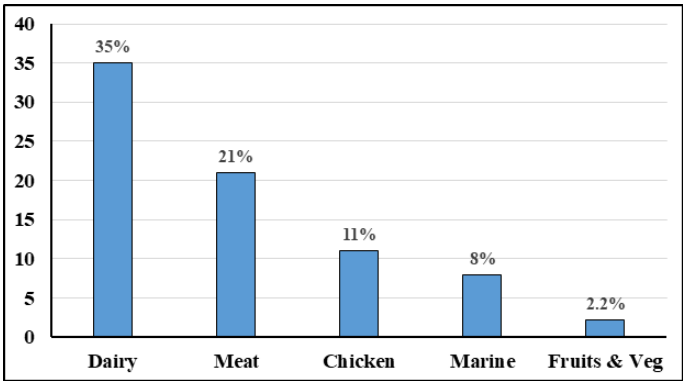

Figure 1: Processing level for different commodities in India-2014

IMPORTANT MEAT SECTOR ISSUES IN INDIA

Lack of specific breeds for meat production/absence of selection process /poor genetic potential

Non-availability of quality feed and absence of grazing land

Non-availability of basic minimum facilities for live animal marketing and absence of animal grading system

Limited number of Environmentally Controlled poultry farms, absence of HACCP measures and poor biosecurity implementation

Movement of animals between states, absence of disease free zones and lack of traceability system

No recording of antibiotic and hormonal use and enforcing withdrawal mechanism

- Transportation vehicles for live animal, animal carcasses and meat
- Cold-chain logistics and tax on frozen meat products
- Market intelligence (both domestic and export) and shortage of skilled manpower

CHALLENGES AND SUGGESTED SOLUTIONS FOR MEAT SECTOR IN INDIA

Challenges

a. Failure of Municipalities to provide basic minimal facilities or infrastructure (supply of potable water, proper roads, slaughter and dressing facilities) to produce clean and safe meat for consumers. Absence of infrastructure for slaughterhouse waste utilization.

b. Restrictions on slaughter and utilization of male buffalo calves. Steps are needed to curb mortality of male buffalo calves in different parts of the country as these calves could otherwise be salvaged for providing quality meat for export and domestic consumption. As per the available data, 14 million male buffalo calves perish annually. If 70% can be salvaged, reared and processed @ 175 kg per head–including edible offals – when reared they could yield 1.72 million tonnes of additional meat per annum. Even if we save 50% of the 14 million male buffalo calves and fatten them for the meat industry then they have a potential worth Rs. 22,000 Crore of export.

c. Lack of specific meat breeds, slaughter of animals at very young age or early age due to shortage of feed and absence of uniform slaughter policy across India are resulting in both qualitative and quantitative loss.

d. Long distance mobilization and transportation of live animals/ birds. Live pigs transportation from Telangana and Andhra Pradesh to NEH states; buffalo transportation from Telangana and Andhra Pradesh to Kerala. Transportation loss, middleman involvement and cost escalation.

e. Lack of livestock mandis, vehicles for transportation of live animals as per standard guidelines, animal loading and unloading ramps.

f. Around 90% of broiler chicken are produced in 6 states (Maharashtra, Tamilnadu, Karnataka, Andhra Pradesh, Telangana and Haryana) and live bird transportation between states resulting in transportation loss besides biosecurity issues.

g. Poor condition of municipal slaughterhouses: lack of approach roads, insufficient potable water supply, floor slaughtering, absence of demarcation between clean and unclean areas, improper recovery and utilization of by-products, inappropriate disposal of inedible waste etc.

h. Lack of refrigerated transport vehicles for dressed carcass transportation; poor condition of retail shops without basic minimal facilities.

i. Absence of skilled manpower for producing clean and safe meat; Lack of awareness about quality, safety, chilling, packaging and modern retailing of meat and meat products; Inadequate knowledge on the potential use, economic value and alternative use of livestock products.

Solutions

1. Studies indicating qualitative and quantitative losses across meat value chain from all food animals and birds must be undertaken covering different zones of the country. Potential value of utilizing animal by-products and meat industry waste need to be evaluated.
   i. Livestock farmer
   ii. Transportation
   iii. Slaughter
   iv. Processing and packaging
   v. Retailing
   vi. Consumption
2. To prevent long distance transportation of live animals and birds and associated losses due to shrinkage, death and diseases, it is suggested to construct one hygienic slaughterhouse at each district place or in each cluster with all the facilities for efficient utilization of edible and in-edible by-products and effluent treatment plant. Instead of one big slaughterhouse in Metropolitan cities, it is suggested to establish few modern slaughterhouses surrounding the city in peri-urban areas so that the small meat traders (with 3-5 animals) need not to transport the animals for long distance.

3. Slaughterhouse construction/modernization, waste utilization and effluent treatment must be an important component and must be incorporated in SMART CITY plans.
4. Banning of scattered poultry processing in wet market within city limits and popularization and promotion of chilled and packaged poultry meat.
5. Municipalities to create better facilities at service abattoirs: Roads, potable water supply, composting, rendering and waste disposal facilities. Each municipal abattoir/slaughterhouse MUST have Rendering/Composting and Effluent treatment plant for solid and liquid waste management.
   i. Each service abattoir should have a waste management plan which stipulates the procedures for collection, treatment and disposal of solid and liquid waste.
   ii. Solid waste derived from lairages in the form of left over feed and fodder material and sweeping of dung and fecal material and paunch manure from slaughter hall must be disposed using composting and vermi-composting. This should be carried out by local bodies.
   iii. Solid waste comes from animal tissues such as dead animals, condemned carcasses and meat, offal, inedible by products from the service abattoir and waste from chicken stalls. Proper system for organized collection of this stream of solid waste and processing them in a dry rendering plant of appropriate size to be undertaken by local bodies.
   With respect to chicken stalls, an appropriately designed four / three wheeler van must be used for collecting solid waste from chicken stalls daily. The operating cost of the van may be recovered by charging monthly fees from the chicken stalls.

   Review the existing restrictions on buffalo slaughter especially SLAUGHTER OF MALE BUFFALO CALVES and propose regulations with a pragmatic approach for efficient utilization of buffalo resources with better productivity and many other associated benefits in terms of economic, social, livelihood, employment, food and nutritional security etc.
7. Municipalities may authorize or sublease the construction/ modernization of slaughterhouses, maintenance, clean and safe meat production, waste utilization and all other meat sector related activities (animal transportation, ante-mortem and post-mortem examination, meat retailing etc.) to ANIMAL HUSBANDRY Departments or MEAT DEVELOPMENT CORPORATIONS of respective states.
8. In the currently approved food parks/mega food parks there are hardly any meat/poultry processors due to restrictions from other food commodity entrepreneurs about inclusion of meat and poultry. Exclusive ANIMAL PROTEIN food parks/food hubs for meat/fish/poultry/egg may be created.
9. Agencies/private entrepreneurs to link small scale entrepreneurs to food parks for better marketing of their produce.
10. Skill development programmes and hands-on trainings to various stake-holders in meat value chain viz, butchers, meat processors, retailers, veterinarians, quality control inspectors and other meat processors in the area of clean and safe meat production, waste utilization, value added meat products etc.
11. Creation of agencies/NGO's to link all the small and medium-scale entrepreneurs and stake-holders to MARKET in a value chain: Farmers, Producers, Primary Processors, Secondary Processors, Transportation, Storage, Wholesalers, Retailers, Quick Service Restaurants, Super-Markets and Service Providers etc.

Market infrastructure

a. Establishment of livestock trading mandis in each district/ clusters.
b. Regulate movement of live animals between states and encourage establishment of disease-free zones, quarantine stations and mobile sanitizing vehicles.
c. Policies to restrict the movement of live animals and birds and encouragement for transportation and sale of chilled, packed and frozen meat.
d. Promotion of e-commerce and online meat marketing entrepreneurs to create better processing, storage, transportation and other logistics in meat value chain.

Cold chain and storage infrastructure along the chain

- Better infrastructure creation for live animal transportation, animal market mandis, modern slaughterhouses for clean and safe meat production and waste utilization.
- Refrigerated vehicles for transportation of carcasses and meat from slaughterhouses to retail meat shops.
- Chiller and freezer facilities at retail meat shops.
- Creation of MEAT FOOD HUBS in states where there is great demand for meat and meat products (Kerala, West Bengal and North-Eastern States).
- Establishment of FOOD BANKS, ANY TIME MEAT (ATM), MEAT VENDING MACHINES, SMART KIOSKS at airports and railway stations for ready to eat and frozen meats.
- Roping private entrepreneurs and NGO's for establishing COMMUNITY FRIDGE.

Way forward for Livestock/poultry producers, meat processors and exporters

- Building sustainable production chain
- Industry driven collaboration to advance food safety and traceability
- Agencies/Government Departments to link key-stakeholders in a value chain
- Judicious and responsible use of antibiotics to maintain health, hygiene and welfare of animals
- Ensuring animal health, welfare, environment protection and efficient usage of natural resources
- Obtaining globally recognized certification
- Evolving a comprehensive national policy for slaughter of animals and meat production system in India

CONCLUSION

It is important to focus on the allied enterprises viz., dairy, sheep and poultry sectors which have the advantage of the presence of expertise, variety of products, large market and infrastructure in

the State. Unlike crops, there is no price volatility in case of milk, poultry, sheep and goat meat. Therefore, there is a need to mobilize more people to the sheep, goat and poultry sector. Successful milk cooperative models must be adopted in poultry, sheep and goat sector with complete value chain approach. Private sector and multi-national companies must be roped in for value addition and successful marketing. Easy financing by commercial banks must be encouraged to establish micro, small and medium scale enterprises. Easy access to professional inputs including skill development, finances, cold chain, transportation and markets are the key elements to ensure doubling farmers income in the coming years.

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