

MARKETING OF LIVESTOCK PRODUCTS – DOES QUALITY AND HEALTH OF CONSUMERS REALLY MATTER?



The Government of India stipulated several standards, regulations and guidelines to produce and market livestock products. But, compliance to standards is neither enforced nor monitored in a desirable manner. All stakeholders are to be blamed for the production, processing and marketing of poor quality livestock products, argue Dr SVN Rao and Dr PVK Sasidhar.

CONTEXT

There is a phenomenal increase in the demand for foods of animal origin over the years, mainly due to population growth, urbanization, enhanced per capita income and shift in consumers' preference to these high energy products. Concomitantly, the production of livestock products such as milk, meat and eggs has also gone up. With increase in demand and supply, the quality of these food products is being compromised leading to public health concerns. An estimated 600 million people in the world fall ill after consuming contaminated food, and 420,000 die every year. Outbreaks of Salmonellosis were mainly due to consumption of infected eggs and poultry meat, food poisoning with *Campylobacter* species was due to the consumption of raw milk or uncooked poultry meat, and *Escherichia coli* infections were due to the consumption of unpasteurised milk and undercooked meat (WHO 2022).

The Government of India (GOI) has created the Animal Husbandry Infrastructure Development Fund of Rs. 15000 crore under the *AtmaNirbhar Bharat Abhiyan* stimulus package in 2021 to establish i) the dairy processing and value addition infrastructure; ii) meat processing and value addition infrastructure; and iii) animal feed plants. The GOI also stipulated several standards, regulations and guidelines to protect both farmers and consumers. But, compliance to standards is not enforced or monitored in a desirable manner in the field of agriculture, which is a serious concern (Prasad et al. 2021).

The major issues in the production, processing and marketing of poor quality foods of animal origin (milk and milk products, and meat and meat products) are discussed in this blog.

MILK AND MILK PRODUCTS

Most of the dairy farmers are smallholders who rear a few heads of cattle and produce 5 to 10 litres of milk/day. They do not follow the basic practices of clean milk production resulting in poor quality of milk. The initial bacterial load is high and there are no quick tests to test it. The marketing agencies in the organised sector (milk cooperatives, private dairies) make payment to the producers on the basis of 'Fat' and 'SNF' but not on the bacterial load. This is one of the main reasons for supply of poor quality milk to consumers. When the initial quality of milk is low it is not possible to improve it. As the saying goes '*you can never get good quality cheese from poor quality milk*'.

The unorganised sector – comprising of vendors and contractors – supplies about 60 per cent of the liquid milk to the consumers in India. The reasons being, vendors collect the milk from the doorsteps of the producers and provide services such as advancing loans for the purchase of cattle, feed, or even for family functions. Some vendors (milker-vendors) even milk the cows and collect the

(unadulterated) milk from the producers. These vendors usually supply poor quality or sub-standard or adulterated milk to the consumers. The consumers also purchase milk from the vendors because of door delivery, payment at the end of the month, and they do not put much thought on the quality of the milk they purchase.



Milking of cows in unhygienic premises ©Dr.M.Rajalakshmi, River, Puducherry

Even at the processing stage also some of the dairies neglect the Standard Operating Procedures (SOPs) in processing, packing and storage, resulting in supply of poor quality milk products to consumers. Here are some examples which illustrate how the consumers are taken for a ride and risk their lives.

1. Violating FSSAI Regulations

The FSSAI survey reported that 41 per cent of the milk samples were of poor quality, and 7 per cent samples were unfit for human consumption. There were several instances wherein the quality of the dairy products, especially Ghee, Milk powder, Paneer, Milk sweets, etc., was compromised. These milk products are being prepared by many – ranging from small scale processors to large scale multinational companies. The small scale processors usually violate all the FSSAI regulations because they handle small quantities of substandard milk, unhygienic practices including unhygienic premises. Even the multinational companies have been found violating food safety norms and regulations (Box 1).

Box 1: Are Trusted Brands Failing FSSAI Regulations on Food Safety?

The Food Safety and Drug Administration (FSDA) in Agra found detergent in milk samples of Mother Dairy. While FSDA officials say that they have started the process of cancelling Mother Dairy's license for its Shahpur plant at Bah tehsil for using detergent in milk, the company denies the charges. Mother Dairy will also be charged a fine of Rs. 5 lakh for producing substandard quality of milk at its Gajauraha plant. While the products were first tested at the Meerut laboratory, Mother Dairy was not convinced of the results and sent them to Central Food Laboratory in Kolkata. Like the Meerut lab, here too one sample tested positive for detergent and another showed 50% deficiency of SNF (solid, not fat) powder in milk which makes it a substandard product. In its clarification, Mother Dairy has said that the milk undergoes four levels of thorough testing at input, processing, dispatches and even at market level as

determined by FSSAI regulations. They further stated that every tanker of milk that reaches their plants has to pass 23 stringent quality tests. Only after getting clearance for contamination, whether water, urea, oil or detergent, is the milk accepted for processing.

Live beetles were discovered by a mother in a packet of 'Cerelac' (Nestle) that was bought from a local pharmacy in Perur (Tamil Nadu). The father has filed a complaint with the Food and Safety department who have sent the sample for testing. Once the report is obtained the official complaint will be filed. Nestle has not yet replied to the email sent by the Food Safety Department. In another case, a young IT employee was shocked to find that the 'Cerelac' he had bought for his one-year-old son contained red worms in the wheat and milk powder. In this instance too the product has been sent to the government food laboratory for testing. The officials are of the opinion that the worms may have multiplied after packaging and they look like weevils that infect wheat. These worms have a way of penetrating wheat and laying eggs which get hatched once the wheat is crushed. Live larvae were also found in a packet of Nestle NanPro 3 milk powder last week.

Source: <https://foodsafetyhelpline.com/are-trusted-brands-failing-fssai-regulations-on-food-safety/>

2. Adulteration of Milk Products

There are several ways of adulterating high value milk products such as Ghee, Butter, Cheese, etc. For example, palm oil is used in the preparation of ghee as the former is much cheaper than ghee (Box 2). Similarly, some unscrupulous elements supply their substandard milk products in well-established branded packaging materials to hoodwink consumers (Box 3).

Box 2: Palm Oil being used as an Adulterant in Desi Ghee

Palm oil was being used as an adulterant in the manufacture of desi ghee, revealed a report by the state Food Testing Laboratory, Kharar. Notably, Patiala police had seized 250 kg of spurious desi ghee. Now, on the basis of the report, the District Food Safety Officer (FSO) will file a case in the court of Additional Deputy Commissioner (ADC) against the owner.

The District Health officer (DHO) Satinder Singh said the report had already revealed that palm oil was used as an adulterant in desi ghee which was a clear violation of the Food Safety Act. He said, "Usually palm oil is used in desi ghee to fulfil the required fat content because it is cheaper. However, the use of any adulterant to increase fat is not permissible." Significantly, health officials informed that desi ghee prepared by MS Traders, at Cheeka town in Haryana — to whom the samples belonged — was being sold under the name of prominent brands, including Milkfood, Nutkhat and Amul Desi Ghee.

Source: <https://www.tribuneindia.com/news/archive/punjab/palm-oil-used-to-manufacture-desi-ghee-reveals-report-837019>



Milk vendor collecting milk from doorsteps of the farmer © Dr.M.Rajalakshmi, River, Puducherry

Box 3. Selling Sub-standard Milk and Milk Products in Branded Packaging Material

In a big relief to the country's biggest dairy brand 'Amul' (Gujarat Co-operative Milk Marketing Federation or GCMMF) who had filed a suit against one of the exporters, namely Capital Ventures Pvt. Ltd, seeking restraining orders for illegal and unauthorized export of Amul's milk and milk products, the Delhi High Court directed the Customs Authorities to mandatorily seek the requisite certificates/approvals issued by Export Inspection Council prior to such consignments being permitted from all the exporters of milk and milk products. Capital Ventures Pvt. Ltd conceded that it did not have the statutory approvals and gave an undertaking to the effect that it shall not export 'AMUL' milk and milk products without obtaining the necessary approvals and certificates. The Delhi High Court has passed specific directions to the Customs Authorities to mandatorily seek from exporters of milk and milk products all requisite certificates/approvals before allowing the consignment for export as per Export of Milk Products (Quality Control, Inspection & Monitoring) Rules, 2000.

This order comes as a major relief for Amul as there had been a huge illegal and parallel export of 'Amul' products, which products were meant for sale within the territory of India only. These products were exported without any authorization, approvals or certificates. Amul further states that it is in receipt of names of many such export houses which have been illegally exporting its products. The organisation, in order to completely uproot such illegal and parallel exports, is determined to take necessary action against such exporters under the Customs Act which would include prosecution against such exporters under suitable provisions that would invite imprisonment of up to three years.

Source: <https://www.nuffoodsspectrum.in/news/49/7127/gcmmf-aims-to-uproot-illegal-and-parallel-export-of-amul-products.html>

Some unscrupulous people started selling their sub-standard milk and milk products packed in branded sachets, tins and bottles posing a serious threat to the dairy industry. Hyderabad (Patancheru) police conducted searches on a milk factory at Pashamailaram Industrial Estate on city outskirts and seized adulterated dairy products, particularly curd, cheese and paneer. Police found several used buckets of top brands from the premises. Around 50 top brand buckets filled with curd made in the factory were found. They are supplying curd to hotels mostly in the old city. Every day, they are supplying 1000 to 5000 kg of curd. The factory manager was taken into custody and a case of cheating was registered.

Source: <https://timesofindia.indiatimes.com/city/hyderabad/milk-unit-raided-adulterated-products-of-top-brands-seized/articleshow/89126562.cms>

3. Supply of Synthetic Milk

Even worse is synthetic milk being manufactured by mixing glucose, urea, refined oil, milk powder and water. Other chemicals, including hydrogen peroxide, are also used. Some of the by-products manufactured are synthetic cheese and mawa (Box 4).



Synthetic milk (Source: The Hans India, 5 July 2016)

Box 4. Two Brothers turned into millionaires in seven years, Sold Synthetic Milk in Delhi, UP

Seven years ago, two brothers from a village in Madhya Pradesh's Morena district could be seen supplying milk on a motorcycle to a nearby dairy. Today, they are said to be owners of a Rs 2 crore milk chilling plant, milk tankers, three bungalows, SUVs and agricultural land, according to police. It's not a magic wand that has changed the fortunes of Devendra Gurjar (42) and Jaiveer Gurjar (40), who live in the village of Dhakpura of Morena district, some 465 km from Bhopal. Rather, it is their illegal business of manufacturing synthetic milk and its by-products that are slow poison for consumers, an investigation of Madhya Pradesh police's special task force (STF) has revealed. Along with Devendra Gurjar, a few other dairy owners in Chambal whose names appear in an FIR became rich in just five-seven years by allegedly selling synthetic milk not only in Madhya Pradesh but also to renowned companies in Haryana, Delhi, Uttar Pradesh and Rajasthan, the investigation has shown.

Source: <https://www.hindustantimes.com/india-news/how-synthetic-milk-powered-the-meteoric-rise-of-chambal-traders/story-baBu9ldQfrz2H6SFCHyzCK.html>

4. Antibiotic Residues in Milk and Milk Products

Antibiotics are commonly used in veterinary practice to treat various ailments, especially mastitis, and as a result milk of some animals may contain residues of antibiotics. When humans consume milk and milk products which contain antibiotic residues, and then when they fall sick they may not respond to some antibiotics as the disease causing organisms might have developed resistance, i.e., Anti-Microbial Resistance (AMR).

A study published in the Indian Journal of Medical Research in 2019 indicates that with 700,000 people losing their lives due to AMR every year and with 10 million people projected to die from it by 2050, AMR will claim more lives than cancer and road accidents combined. The study also mentions that AMR has been rising disproportionately in India over the last few decades, and a multi-pronged approach is required to minimise its devastating effects (Myupchar 2020).

AMR is caused mainly due to indiscriminate use of antibiotics by farmers and veterinary professionals. "Farmers often sell milk while the animal is under treatment, which increases the chances of antibiotic residues (*passing on to consumers*). While milk sold directly to consumers is not tested, contrary to what one would expect, processed milk sold in packets is also largely unchecked for antibiotic residues," says Amit Khurana, Programme Director, Food Safety and Toxins Programme, Centre for Science and Environment (CSE). The necessity to bring about awareness among the livestock extension personnel on the impact of AMR on livestock and human health was very well discussed by Ramesh et al. (2019).

AMR is considered to be a serious threat to public health. A recent study (Toth et al. 2020) revealed the presence of AMR genes in raw milk for human consumption. They analysed raw milk samples from public markets sold for human consumption. The samples contained complete ARGs influencing the effectiveness of Acridine dye, Cephalosporin, Cephamycin, Fluoroquinolone, Penam, Peptide antibiotics and Tetracycline. One of the ARGs, PC1 beta-lactamase, may also be a mobile element that facilitates the transfer of resistance genes to other bacteria, e.g., to the ones living in the human gut.

In June 2017, ICMR organized a meeting with all the relevant stakeholders to discuss the possibility of reserving a few classes of drugs for human use and mitigating the impact of AMR (Box 5).

Box 5: Recommendations of the ICMR (2017) on Mitigating the Impact of AMR

1. Critically important or 'last line' antibiotics for humans (WHO 2017) Viz polymyxins, Glycopeptides, Fluoroquinolones and fourth- and fifth-generation Cephalosporin should not be used for treatment in food-producing animals.

2. Penicillin, Tetracyclines, Cephalosporins, Quinolones, Sulphonamides, and Aminoglycosides should be exclusively used for the treatment of animals. Glycopeptides and Carbapenems are to be used in pets.
3. Diagnostic methods for the detection of AMR in animals to be standardized and uniformity should be maintained throughout all veterinary laboratories.
4. Research should be carried out to study the spread of AMR between animals, humans and fisheries. Action points were suggested for urgent implementation of antibiotics used in food animals with the help of DAHDF, ICAR, and Drug Controller General of India.

The CSE's assessment shows that dairy farmers indiscriminately use antibiotics for diseases such as mastitis (infection/inflammation of the udder), a common ailment in dairy animals. Often these include critically important antibiotics (CIAs) for the growing crisis of antibiotic resistance. Biswas et al. (2019) reviewed the research on AMR and made the following recommendations to conserve the effectiveness of antimicrobials in humans and animals:

1. Educate farmers, veterinarians and consumers on the dangers of AMR;
2. Phase out the sub-therapeutic use of antibiotics;
3. Nationwide surveillance and monitoring system to track veterinary antibiotic use, resistance and residues;
4. Develop new antibiotics and diagnostic tests to keep up with resistant bacteria as well as new diagnostic tests to track antibiotic resistance.

5. Illegal Use of Oxytocin and Other Hormones

When dairy animals are unable to give milk due to calf's death or separation from calf, oxytocin injection of up to 5 IUs is given twice a day to stimulate milk let-down, especially in buffaloes. Injecting growth hormones to hasten growth and oxytocin hormone to relax udder muscles for milk let-down are painful and stressful to dairy animals. As per the PCA Act, 1960, Oxytocin, a hormone is not supposed to be used other than for treatment of animals and it should not be sold by pharmacists without a proper prescription by a qualified veterinarian. Furthermore it is an offence as per Section 12 of Criminal Procedure Code, 1973, as well (Box 6). However, oxytocin injections are freely available and dairy farmers, especially those maintaining buffaloes, usually stock them.

It was reported that the consumption of milk and milk products containing oxytocin may lead to early onset of puberty among girls, development of breast in male, and deficiency of testosterone production due to hormonal imbalance. It may also lead to abortions if the milk containing oxytocin is consumed by pregnant women. Taking serious note of this misuse of oxytocin, the Government of India banned its use for purposes other than treatment of certain ailments (Box 6). Despite this ban, over the counter sale of oxytocin and its use for milk let-down by dairy farmers continues.

Box 6: Ban on Import and Over-the-counter Sale of Oxytocin

The Government of India banned the import and over-the-counter sale of the feel-good hormone oxytocin that is used by child traffickers to speed up puberty in girls who are then pushed into prostitution. The hormone is widely used in dairy farms leading to harmful effects on humans and livestock. The government also restricted its manufacture to the public sector to check its growing misuse. The hormone is permitted for use mainly to speed up labour in pregnant women so as to avoid risks or complications. However, the hormone, in its various forms, is increasingly being used illicitly, and manufactured clandestinely without proper license. The health ministry issued an order to regulate and restrict its manufacture, sale and distribution after going through recommendations made by the Drugs Technical Advisory Board, a statutory body under the Drugs and Cosmetics Act, 1940.

Source: Hindustan Times, New Delhi April 28, 2018.

MEAT AND MEAT PRODUCTS

Meat is mostly obtained from sheep and goats, poultry, pigs, cattle and buffaloes. Most of the animals are slaughtered in unauthorised slaughter houses violating all the existing laws and regulations. A conservative estimate indicates that there are only 3600 legal slaughter houses, but there are more than 32,000 illegal slaughter houses in the country (Kang 2003). As on 17 February 2022, there are 65 integrated abattoirs-cum-meat processing plants, which include Al Kaif Industries, Al Aqsa Frozen Food Export, Allana Cold Storage Pvt. Ltd and seven stand-alone slaughter houses in India registered under APEDA. Most of these were registered for slaughter of buffaloes and processing of buffalo meat and are located in Uttar Pradesh. (Source: <https://apeda.gov.in/apedaweb/site/Announcements/PLANTS-1-APPROVED-INDIAN-ABATTOIRS.pdf>).



Road side slaughter house © Dr.M.Rajalakshmi, RIVER, Puducherry

Slaughtering is performed in open and dirty premises in public and that too without stunning (humane slaughter), using unhygienic water, and unclean vessels etc., for supplying unhygienic and poor quality meat to consumers. One can notice roadside slaughter houses in almost all parts of the country. These slaughter houses dispose of the waste in the nearby drains, produce a lot of stink that is unbearable to the residents in the locality. They pollute water, land and air. It is a pity that this unscrupulous practice is going on since decades and the concerned municipalities and corporations are turning a blind eye to these slaughter houses. Unfortunately, the consumers keep purchasing such poor quality meat for the sake of convenience as these meat shops are operating within their close vicinity, and anyway there are very few meat shops which sell quality meat. Although, the GOI has introduced a

scheme to promote modernization of slaughter houses with huge subsidies, there are not many takers including the municipalities.

The violation starts from the transport of animals for slaughter to sale of meat which is discussed briefly under the following heads:

1. Transport of Animals for Slaughter

The conditions for the transport of animals for slaughter are prescribed in OIE Terrestrial Animal Health Code 2019, The PCA (Slaughterhouse Rules) 2001 and amended in 2010, and Food Safety and Standards Regulations (FSSR), 2011. Almost all the conditions are laid down clearly in these rules and regulations for transport of animals but the regulatory authorities turn a blind eye on violation of these standards. One can notice the way cattle and buffaloes (overcrowded without any space to move) are transported in trucks from Andhra Pradesh, Telangana, Tamil Nadu and Karnataka to Kerala.



Transport of animals in trucks -over crowded ©Deccan Chronicle, Jul 9, 2015

2. Meat Shops and Slaughterhouse Offences

Food Safety and Standards Act, 2006, has laid down certain conditions pertaining to slaughter houses and sale of meat. Some of the important provisions that are being violated are:

- a. Sale of meat or slaughter of animals without FSSAI License - attracts punishment of imprisonment up to six months and a fine up to Rs.5 lakhs;
- b. Misbranded meat (e.g., beef sold as mutton) and selling meat covered with flies, dust, and smoke, or anything else that is not supposed to be in the meat - Penalty may extend up to 1 lakh rupees;
- c. Meat prepared and sold in unhygienic conditions - Penalty may extend up to 1 lakh rupees.

Details of Slaughterhouse Rules, 2001 and FSSR 2011, can be obtained from the following websites:

[http://awbi.in/awbi-pdf/\(SLAUGHTER%20HOUSE\)%20RULES,%202001.pdf](http://awbi.in/awbi-pdf/(SLAUGHTER%20HOUSE)%20RULES,%202001.pdf)

<https://fssai.gov.in/>

The violation of rules or standards is very common in almost all the slaughter houses in the country, except for a few modernized slaughter houses in the private sector (Box 7).

Box 7: Violation of Rules or Standards in Slaughterhouses**The Sad Story of Idgah Slaughter House**

Idgah, Delhi's principal slaughter house spread over seven acres in Sadar Bazar area of Delhi, is more than 100 years old and it is owned by the Delhi Municipal Corporation. About 8000 animals (instead of the permitted 2500 animals), which include sheep, goat and buffaloes are slaughtered every day. In addition to this, the only authorised slaughter house, there are more than 15,000 illegal slaughter houses in Delhi. The Idgah slaughter house alone generates about 60 to 70 tonnes of slaughter house waste every day. After a long legal battle, the Supreme Court ordered the shifting of the slaughter house from Sadar Bazar. The Idgah slaughter house, was then shifted to a newly constructed modernized slaughter house at Ghazipur (East Delhi) in 2009. Despite incurring an expenditure of Rs. 150 crore on modernization, all the FSSAI regulations are being violated in slaughtering of animals. The panel of experts reported that no ante mortem and post mortem inspection of animals were carried out according to FSSAI and Supreme Court directions. The odour emanating from the premises was obnoxious and overpowering.

Aligarh's Slaughterhouse Woes

A DTE correspondent visited Aligarh to check its *kattighar* (slaughter house) and came back with a gory story. The Aligarh office of Uttar Pradesh Pollution Control Board ordered shutting down of the *kattighar* in November 2002. But the Nagar Nigam Aligarh (NNA) has not yet acted on the order. It has in fact contracted out the slaughter house located in Makdoomnagar to a private contractor, who has further sub-contracted it to three butchers and the NNA is not even aware of this! The municipal body on its part earns Rs 12 lakh per annum from the private contractor.

The three butchers carry out the slaughtering, not in the *kattighar* premises, but in three private godowns, which have no arrangement for drinking water and are poorly ventilated. "The minimum we expect from NNA is to provide us with drinking water," says a butcher. One butcher slaughters about 70 buffaloes every day. At least 2,500 buffaloes are slaughtered in these godowns daily and the meat is supplied to various cities such as Aligarh, Khurja, Mathura and even to Delhi.

As per the Uttar Pradesh Nagar Nigam Act, 1955, all animals to be slaughtered have to undergo a health check-up. But Aligarh *kattighar* follows no such rules. And NNA officials admit to this. Some of the waste, such as hides and wastes, are sold to private parties and the rest is dumped as landfill at Makdoomnagar.

Source: In - Depth The meat you Eat <https://www.downtoearth.org.in/indepth/the-meat-you-eat-13283>

It is clear that the meat coming out of these slaughter houses (both legal and illegal) is sold in the market without any quality check. One can also see that even meat unfit for human consumption is sold in the market. The methods prescribed for disposal of slaughter house waste and treatment of water are not being adopted, leading to pollution of air, water and land, leading to serious health hazards in the country.

3. Modernization of Abattoirs

Ministry of Food Processing Industries is implementing the Central Sector Scheme for Setting up/ Modernization of Abattoirs under which assistance in the form of grant-in-aid is provided for setting up of new and modernisation of existing abattoirs to local bodies (Municipal Corporations and Panchayats), Public Sector Undertakings/Co-Operatives/Boards under Government. However, strangely, no grant-in-aid has been released under this component till March 2016.

Source: https://www.business-standard.com/article/government-press-release/modernization-of-abattoirs-116031501191_1.html

4. Privatisation of Slaughter Houses

There are a few slaughter houses in the private sector which are supposed to be better than those being operated in the country. These slaughter houses claim to be adopting the standards and SOPs to mitigate the stench coming out of slaughter houses and treatment of water and disposal of the waste (Box 8).

Box 8: Modern Private Slaughterhouses

Al Kabeer Abattoir: Al Kabeer, an NGO, operates the largest integrated meat processing complex in Asia, located in Zaheerabad (Telangana). It has been in operation since 1979. Every month Al Kabeer exports over 4500 tonnes of quality meat to several Gulf and South Asian countries. Even this sophisticated slaughter house is not free from allegations, which include over loading while transporting buffaloes to slaughter house, inhuman practices in slaughtering of animals and slaughtering more number of animals than permitted.

Allana Abattoir: M/s Fregaerio Conserva Allana Ltd first set up a modern slaughter house at Mourigram, Kolkata in 1999. It has a capacity to slaughter 1500 buffaloes per day. It has an Effluent Treatment Plant (ETP) to treat slaughter house waste water and has a rendering plant to process slaughter house waste. Later, this company set up slaughter houses at Ghaziabad, Agra, Chandigarh, Aurangabad, New Delhi, Mumbai, and Zaheerabad (Telangana). Some of these plants are not in a position to run ETPs for one or the other reasons and is leaving the untreated water to pollute the nearby rivers. The one at Zaheerabad appears to be an exception, which claims to be treating water and the treated water is being used for horticulture and pisciculture. Similarly, solid waste of about 60 tonnes is used to generate energy through biomethanation process and the same is being used for running refrigeration units. It is also selling animal hair, hides, horns, etc. But, each of these plants being food processing plants require a huge quantity – that is 20 lakh litres – of fresh water per day. Till date there is no solution to reduce the use of precious water.

5. Poultry Meat/Pork/Fish

Poultry meat production in India has been increasing over the years and it has touched an all-time high of 4.1 million tonnes in 2021. Poultry meat comes from broilers, exclusively reared for meat, spent chicken (layers after completion of egg laying period), and local or desi birds (used for both meat and eggs). Broiler chicken usually reared for 6 weeks or less than that reach about 1.5 to 2 kilo body weight during this period. The meat obtained from broiler chicken is considered inferior in quality because they are fed with feed additives and growth promoters. In addition they are reported to be hosts of bacteria such as *salmonella*, *campylobacter* and *Escherichia* species, responsible for causing food poisoning. Indians prefer desi chicken and desi eggs but their cost usually prohibit many from consuming broiler chicken. Spent chicken is considered as tasteless since the bird has spent its life all along in producing eggs and by that time it will be more than one year old. As most Indians prefer to consume fresh meat, the birds are usually slaughtered in unauthorised slaughter houses which are a source of pollution. Fortunately, the organised poultry giants like Suguna, Venakateswara, etc., follow SOPs in slaughtering, dressing, packing, storing and selling in the organised markets such as malls, departmental stores, etc. Although the consumption of these packed products is increasing these days, its share is less than fresh chicken.

The slaughter of country pigs for pork is totally unorganised and the quality of such pork is very poor. There are now organised farms where mostly the white pigs or crossbreds are reared for production of white pork, which is in great demand. However, the practice of keeping the carcass in cold storage for about 12 hours is mostly not followed, rendering the quality of pork very poor. This is a serious concern, especially in the North East where the consumption of pork is more.

Fish production, both inland and marine fisheries, has also registered an all-time high of 14.16 million tonnes in 2021. Fish consumption also poses serious threats to human health as it is contaminated with a variety of bacteria and virus. Increased use of antibiotics in aquaculture is also a great concern which is a potential source of AMR to humans. The emergence of aquaculture is also posing serious threat to the environment as it is polluting the water, air and land. In addition the fish coming out of aquaculture is considered harmful as the fish are fed with a variety of feed additives and food waste to increase the weight. The ponds, rivers, and seas are also being polluted with the release of pollutants into these water bodies. The fish coming out of these water bodies are not free from several

pollutants (insecticides, pesticides, heavy metals, etc.) which cause various health problems in fish (Malik et al. 2020). These unhealthy fishes naturally pose serious health problems in fish consumers.

6. Storage of Meat and Meat Products

Meat and meat products are supposed to be stored in refrigerators or deep freezers. The star hotels and super markets need such facilities. But unfortunately, due to improper maintenance and lack of monitoring and supervision by the concerned officials, poor quality meat and meat products are sold to the consumers who are therefore at risk. The possible reasons for low food poisoning cases are summarised in Box 9.

Box 9. Why are there not many food poisoning cases in India?

When the Indians are consuming such poor quality milk and meat why are there not many food poisoning cases in India? Probably it is because consumer preferences, such as buying fresh meat – that too in small quantities – inability to store the meat due to lack of refrigerators, and the practice of cooking meat in pressure cookers and boiling the milk (even if it is pasteurised) may be the reasons for fewer food poisoning cases than expected.

7. Advent of Modern Meat Shops

Realising the increase in demand for fresh meat products, companies like Fresh to home, Licious, Tender Cuts, Zappfresh, Fipola, etc., were established with a vision to provide quality meat to their consumers. These companies claim to be supplying hygienically processed quality meat and meat products and varieties of fish to consumers. They supply their products through various marketing channels, including home delivery through online modes.



Modern meat shops ©Dr.J. Tamizhkumaran, Dvara E-Dairy Solutions, Chennai

THE WAY FORWARD

There is a lot of scope to improve production, processing, packing and storing of all the food products of livestock origin that will enable consumers to get quality food. Quantity or production of these products is not an issue, but the quality is. Losses due to food poisoning in terms of productivity and treatment costs are enormous. These costs could be reduced substantially if appropriate measures are taken to ensure supply of quality products to consumers. Unfortunately, this sector does not get the attention that it deserves because of the indifferent nature of all the stakeholders, which include

policy makers, producers, processors, feed manufacturers, various intermediaries, veterinarians as well as the consumers. It is high time these stakeholders work with the unified goal of producing and supplying quality food of animal origin to the consumers without compromising on animal welfare standards as well. The following suggestions could be of help:

1. The veterinary extension professionals have a greater role to play in educating the stakeholders on various quality aspects and steps to improve the quality of food products viz. dairy farmers on clean milk production, milk co-ops on proper quality testing, processing plants (milk plants, slaughter houses and meat processing plants, feed manufacturers, etc.) to follow SOPs and proper packing and storage of these perishable products.
2. Mandatory standards prescribed must be strictly enforced. There has to be proper monitoring and supervision of all the products – starting from production to the sale of these products – to check food adulteration. The people involved in unhealthy practices such as adulteration, misbranding, etc., must be dealt with severely.
3. Organise consumer awareness campaigns to enable the public to understand the importance of consuming quality products.
4. The respective local governments when not in a position to ban the illegal slaughter houses, especially in cities and towns, must look towards regularising at least the minimum standards like separate covered sheds for slaughter and sale, use of quality water, proper disposal of slaughter house waste instead of throwing it in the drains or gutters, and so forth. The butchers need to be trained in following standard procedures so as to improve the quality of meat.
5. The mandatory procedure of conducting ante-mortem and post-mortem examination by qualified veterinarians must be made both in letter and action.
6. Efforts must be made to increase the number of organised slaughter houses to produce quality meat and meat products that will properly meet consumer demand.
7. The establishment of modern meat shops must be promoted. The animal science institutions (ICAR institutes, Veterinary colleges, Dairy Science colleges, and Fishery Science colleges) must be encouraged to process and sell their farm produce through their respective sale counters.

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