PAKISTAN MEAT INDUSTRY: PROSPECTS AND CHALLENGES FOR THE FUTURE MEAT SUPPLY CHAIN POTENTIAL

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ABSTRACT: Meat is one of the major commodities with which food science is concerned. Meat is defined as flesh of animals used as food. The bulk of meat consumed in Pakistan is derived from goat, sheep, cattle, buffalo, camel, fish and poultry. The meat of poultry and fish is considered separately from the rest of meat. The meat of cattle, buffalo, sheep, goat and camel is an example of red meat. Meat (mainly beef) plays a more dominant role in Pakistani food, compared to other South Asian cuisines. It is reported that an average Pakistani consumes three times more meat than an average Indian. Per capita availability of meat in Pakistan is 19kg. Pakistan suffers in international markets as meat slaughtered in traditional abattoirs fails to meet international standards. Despite an increase in milk and meat production, the prices have moved upward abnormally. Exports of livestock, including cows, buffaloes, sheep, and goats, are made to the Gulf States, Iran, and Afghanistan where there is a great demand for high-quality meat due to a lack of supply. The country, though rich in livestock, rarely got a chance to export meat or meat products to earn foreign exchange. It was offered an opportunity when various Middle East states stopped importing meat from European countries due to the incidence of the mad cow disease. The recent increase in meat prices is attributed to the export of live animals or meat to the Middle East and Afghanistan. There was a time when animals used to be imported or smuggled from Afghanistan into Pakistan but after 9/11 the situation suddenly took a 'U' turn. The major constraints include non-availability of indigenous meat breeds, lack of proper animal husbandry practices, absence of modern abattoirs, meat processing plants and low priority by policy makers in the past as well. In meat marketing, the abattoirs are the production points and butcher's shops are the only vending points to the consumers. The abattoirs are seriously lacking basic sanitation facilities (like light, adequate water supply, space for slaughtering and animal keeping, meat refrigeration, and disposal of offal) all over the country. A large portion of the by-products such as blood, glands, intestines, and bones are either wasted or poorly processed. The hygienic conditions of the slaughterhouses and meat shops are very poor. The flayers and butchers are also not professionally trained. The fixing of prices of beef and mutton by local governments are serious obstacles in buying good quality animals for slaughtering. To meet the demand-supply gap of meat in Pakistan, the rate of growth must be at least 5 to 7% per annum. If Pakistan wants to continue meat and live animal export, besides meeting domestic demand, modern meat processing plants and livestock farms should be set up all over the country. Suggested program in this regard are: livestock production and development for meat production, development of feedlot fattening to maximize bio-economic and sustainable meat production and its value addition through meat processing and quality control.

Key Words: meat, red meat, per capita, abattoirs, livestock, butchers, sustainable program

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INTRODUCTION

Meat is an important constituent of human diet since time immemorial. It is the most nutritious, palatable, and satisfying and is always in season. It is a rich source of minerals and proteins containing essential amino acids in a proper proportion and digestible form. However, its consumption is often an indication of the economic status of an individual. The severe protein deficiency and inadequate intake of animal proteins in infants appear to affect adversely the brain cells and central nervous system and can make them mentally

retarded permanently. Meat also has profound effect on stature, height and general health of an individual (Akram *et al.,* 2022; Alvi, 1991).

According to projections, the average global consumption of animal proteins will rise by 14 percent by 2030 compared to the base period average of 2018–2020, mostly due to income and population growth. It is anticipated that the availability of protein from beef, pork, poultry, and sheep meat will increase by 5.9%, 13.1%, 17.8%, and 15.7%, respectively by 2030. But in high-income nations, consumer choice shifts, ageing populations, and slower economic growth. Growing populations will result in a plateau in per-person meat consumption and a shift to the consumption of meat cuts with a greater value (OECD-FAO, 2021). Due to rising demand from nations in Asia and the Near East, where output will generally fall short of need, international traffic in beef will increase. Due to a move toward diets that include more animal products, import demand has been steadily rising in a number of middle and high income Asian countries in recent years. Specific provisions for meat products have been incorporated into international trade agreements to increase market access and foster trade (OECD-FAO, 2021).

In Pakistan, proteins, particularly animal proteins, are in short supply. This situation is the result of years of neglect and absence of scientific planning. The per capita availability of meat in Pakistan has improved from 19 kg in 2008 (Economic Survey, 2007-08). It is still however, far below the standards of World Health Organization. The average per capita consumption of meat in Australia is 120 kg and in Argentina 110 kg, per year. According to the Protein Committee of Pakistan, the daily per capita requirement of animal proteins is about 27 gm. About 10 years ago, hardly 37 percent of the total requirement was available.

According to State Bank of Pakistan data, the meat, dairy, and livestock industries all had growth of 5.6%, but the poultry industry saw a drop of 11.2% in the physical year 2021. (Economic Survey of Pakistan, 2020-21). The government is considering creating meat export processing zones (for Foot & Mouth Disease (FMD), Peste des Petitis Ruminants (PPR), and Highly Pathogenic Avian Influenza (HPAI), facilitating the setting up of contemporary slaughterhouses, and introducing various schemes to facilitate access to financing in order to address investment-related issues in the value-added livestock export sector. The emphasis is on breeding for increased productivity, creating a core herd, and identifying breeds that are best suited to Pakistan's varied agricultural climate zones (Economic Survey of Pakistan , 2020-21).

In 2010, Jamal *et al*. examined the output of red meat in Pakistan from 1994–1995 to 2016–17. Due to Foot-and-Mouth, they were aware of that Disease virus (FMDV) causing a yearly negative big ruminant growth rate of -0.035 in 1995–1996 This has a negative impact on the production of red meat. In addition, from 1996–1997 to 2004–2005, the growth rate showed a downward trend, falling from 0.023 to 0.026 as a result of FMDV recurrence. a recent investigation of the production and export of beef have increased in Pakistan as described by Randhawa *et al*. (2018). The investigation concentrated on on the production of meat's exports and growing performance in Pakistan from 1994–1995 to 2016–17. Results indicated that there is a decline in the production of red meat 1995-96. Mutton has a declining trend as well (Akram *et al.,* 2022).

Pakistan is fortunate in having abundant livestock resources. It has great potential for development of meat industry to meet the needs of not only expanding local market but also the Middle East and Gulf States. National herd consists of 29.559 million cattle, 27.335million buffaloes, 26.488 million sheep, 53.787million goats and 407 million poultry in 2008. The quality and the existing productivity level of local livestock is, however, low as compared with those of advanced countries. Therefore, despite having large numbers of them, they have failed to produce the required quantity of meat.

Numerous studies on livestock production as a business, the scenario of national meat and milk production, meat production, processing, marketing, and consumption, as well as meat quality, packaging, and preservation, and its dietary effects on human health in the context of agriculture production, have been reported to understand the dietary value of meat production (Alexander *et al.,* 2017; Apostolidis and McLeay, 2016; Bosire *et al.,* 2016; Brito *et al.,* 2017; Rehman, Jingdong, Chandio, and Hussain, 2017; Stephens *et al.,* 2018; Wang, Chen, Bai, and Lai, 2018).

The aim of this paper is to study the existing state of meat industry in Pakistan and to discuss various factors that are hindering its progress. At the end, practical recommendations are made, enumerating priorities for research and development work needed for overall improvement of meat production and consumption in the country.

Livestock Resources: Livestock farming is an integral part of rural economy of Pakistan. Despite the laissez faire type of public approach for the development of this sector, it has grown at impressive rate. Presently, this sector is sharing almost 52.2% to the total value addition in agriculture sector and almost 11% of national GDP (Economic Survey 2007-08). Only the milk produced has value higher than the combined value of wheat and cotton.

The livestock production in Pakistan is carried out under a variety of adverse climatic and environmental conditions. The animal husbandry centers around the landless families and small cultivators. To the large

majority, livestock raising is an occupation subsidiary to crop production. These cultivators live on very small fragmented holdings of land maintaining nearly two to three cattle and buffaloes and five to six sheep and goats. In some European countries, the strength of an average herd is more than 30 animals. Thus, labor and resources are very poorly utilized for the production of meat in Pakistan (Akram *et al.,* 2022: Alvi, 1991).

The per capita population of cattle and buffaloes, the major milk and meat producing animals, has been declining since 1976. This has resulted in general rise in the prices of milk and meat. This is the result of years of neglect and absence of scientific planning and development. It is difficult to raise the number of livestock of their productivity under the prevailing high cost of feed, labor, and big investment. The existing prices of beef also do not provide incentives to improve their current level of productivity. Primitive methods are used in cattle and buffalo raising and animal stock is generally poor and under-nourished. The Pakistani farmers, however, must be commended for producing these animals. The situation may go worse if modern and organized cattle and buffalo raising methods are not adopted (Hasnain and Usmani, 2006).

Table 1. LIVESTOCK POPULATION AS PER LIVESTOCK CESUS 2006.

Country/ Province	Cattle	Buffaloes	Sheep	Goats	Camels
		In Million			
Pakistan	29.56	27.33	26.49	53.79	0.92
		Per cent Distribution			
NWFP	20	7	13	18	7
Punjab	49	65	24	37	22
Sindh	23	27	15	23	30
Balochistan	8	1	48	22	41

The table shows that cattle happened to be the dominant animal among large ruminants while goat was dominant among small ruminants in the country. Among the draft/traction animals, the population of asses was reportedly far ahead of other types of animals. The population of livestock varied by province however in the inter-provincial comparison the number of cattle, buffaloes, goats, horses and asses exceeded in the Punjab while of sheep and camels in Balochistan and of mules in NWFP (Economic Survey 2006-07). The situation is better as far as goats and sheep are concerned; they are increasing in number at higher rate than human population. Accordingly, four types of production system of sheep and goats have been described in Pakistan named as nomadic, transhumant, sedentary and household FAO (2004).

BREEDS OF LIVESTOCK AND THEIR PERFORMANCE: Pakistan has some of the best tropical breeds of different categories of livestock. These are well adapted to the climatic and environmental conditions prevailing in different regions of the country. Apart from general external distinguishing features of different breeds, other factors are also involved in comparing their value as meat breeds.

Breeds can differ in efficiency in converting feed into live weight gain. Some claim that this can be as much as 5 to 6 percent. The differences in growth rate of different breeds and sires within a breed may be up to 10 percent. A quick growth to slaughter weight grows continuously in improved breeds evolved for meat production, resulting in a good return on capital invested. The carcass weight, dressing percentage and quality is also high in improved meat breeds and also contain a high proportion of more expensive cuts chiefly from the hind quarter (Khan *et al*., 2005).

CATTLE: The term "cattle" refers to all bovine animals.. The Pakistani cattle belong to the group *Bos indicus*. Excellent breeds of cattle both for milk and draught purposes are found throughout the country. Many of these have outstanding potential for further development into milk, meat and dual purpose types. Pakistani breeds of cattle have a high reputation in foreign markets on account of their draught power qualities and resistance to major cattle plagues and tick-borne diseases. Many breeds of domestic cattle are found in different parts of the country. These can be classified as milk breeds, draught breeds and general utility breeds. Two types of cattle breeds in Pakistan i.e. Milch breeds and Draught breeds. There is no beef breed in Pakistan .Only 30 to 35 percent cattle fall under the *Breed* category while remaining 60-65 % come under *Non-Descriptive* category (non-productive & just rear their calves).With the mechanization of agriculture, these non-descript animals are surplus and just a burden on the economy of the country (Khan *et al.,* 2003). Focal point is to use these surplus animals for crossbreeding purpose either dairy cattle crossbreeding or beef cattle crossbreeding. Per unit productivity can be increased and the deficiency of milk and meat can be fulfilled with the production of crossbreds in this way in comparison to increasing human population.

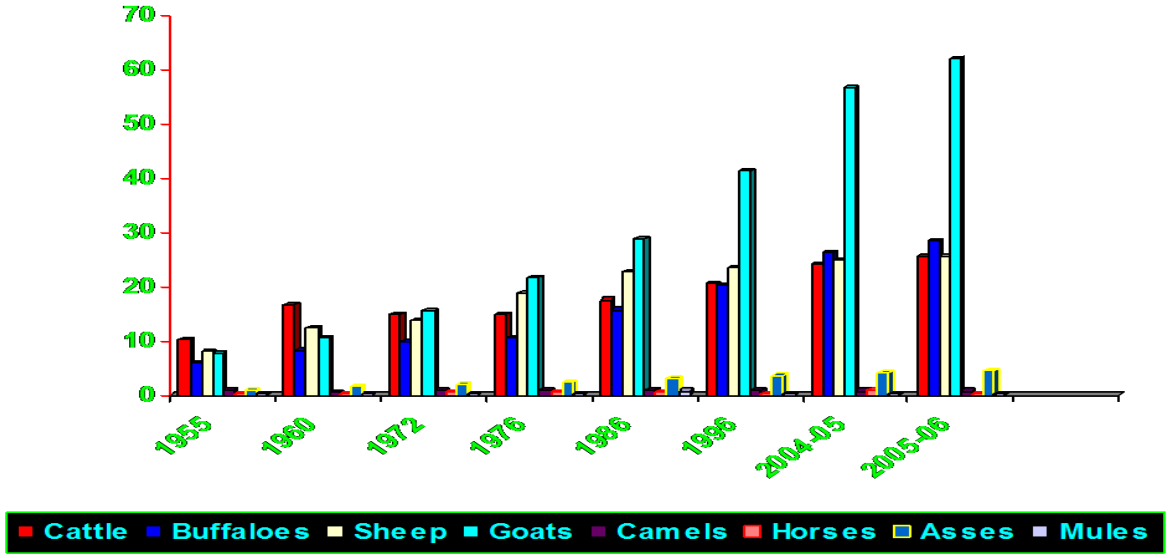

Figure 1. Population dynamics of different breeds of animals

BUFFALOES: Pakistani buffaloes are 'Riverian' or water type and they are important sources of milk and low-cost meat supply in Pakistan. They are also powerful draught animals, hence extensively used for work in the rice fields. Buffalo has now occupied an important place in the diary industry of Pakistan. The buffaloes have tremendous potential for further development and are destined to play an important role in meeting the needs of high quality animal protein such as meat and milk of the growing population of Pakistan. Herd average daily gain of 0.86 kg, when kept in conditions of good management and nutrition. In another trial, males on local feed in a period of 70 days made an average gain of 1.04 kg daily (Alvi, 1991).

The 'Riverian' buffaloes are being carefully selected and bred for improved dairy breeds for many generations in Pakistan – India sub-continent. The important breeds of buffaloes found in Pakistan are described below:-

Table 2. Birth weight of buffalo calves (kg).

Country	Breed	Male	Female
Pakistan	Nili Ravi	39.00	37.6
	Kundi	28.67	27.26
India	Non-discript	28 33	32. 32
	Murrah	33.2	31. 92
Egypt	Non-discript	27.92-	35.43
		38.42	36.35
Italy	Non-discript	41.50	NA

***Source*: Akram *et al*., 1979**

SHEEP: Pakistan is an important sheep producing country and ranks 11th in sheep population in the world. Pakistani sheep are raised mainly for meat and wool and are important to the economy of Pakistan. There are 28 distinct and recognized breeds of sheep spread all over the country in small flocks in the irrigated arrears. They are also maintained under transhumant system in arid and semi-arid regions. The size of flocks varies from a few to hundreds. The productivity is fairly low but it still contributes substantially to the national income. The sheep would continue to have importance for increased mutton production and the demand for mutton is expected to increase gradually. All breeds need to be carefully selected and bred for higher growth rate to yield heavier carcasses at young ages. Mutton is one of the most preferred meats in Pakistan. The development of breeds exclusively for mutton production or production of prime lambs through crossbreeding will have a great scope in the developing economy of Pakistan (Tariq, 2006).

So far, sheep development activities in the country have been directed to the production of wool both for improving the quality and quantity and of mutton from surplus animals. No specific programme, however, has been launched to develop mutton-type breeds. In many countries mutton breeds have been developed which are not only fast growing but also have deeper flesh particularly over the body areas which have greater demand for as meat cuts. England is known for mutton breeds of sheep which are normally called down breeds. The animals have stocky appearance and are short-legged.

The mutton sheep have to be blocky, deep-bodied and low set. The leggy and rangy conformation is undesirable in mutton sheep. The Majority of local sheep are leggy. There is however wide variations in body size, conformation and other economically important characteristics. This indicates that there is a great possibility of improvement of sheep productivity through introduction of technologically proven selection criteria and techniques.

GOATS: Goat rearing is the major occupation of many landless families in Pakistan. The animal has adopted itself to the natural conditions prevailing in all the regions of the country. In certain areas, milch types are developed but majority of herds are raised mainly for meat. Although great breeds are raised in some locations, the bulk of goats in the country are unremarkable.

The goats in Pakistan have not been systematically studied or evaluated for their meat production capabilities. Different breeds have been roughly classified into dairy type (Barbari, Beetal, Dera Din Panah and Kemori) and meat type (Bikanari, Chappar, Damani, Gaddi, Kaghani, Kail, Kajli, Kharasani, Lehri, Sind Desi and Teddy). The dairy type breeds are concentrated in irrigated areas or around urban centers where adequate fodder / grazing is available. The meat type breeds on the other hand are inhabited in such areas where low plane of nutrition is available and goats are grazed with sheep on ranges and remain on constant move in search of vegetation for grazing or browsing.

The performances in economic traits vary in different breeds. The light breeds on an average may weight 20 kg while heavy ones may attain body weight of 70 kg at adult age.

Goat meat is generally preferred over in Pakistan. The consumer's preference studies conducted in central Ghana revealed that local people liked to eat goat meat. The parts most favored were chest and hind legs. Another finding of the survey was burning of the hairs rather than skinning the animal which is said to increase the flavor of meat (Jollans, 1959).

The dressing percentage of castrated Teddy male goats raised at Bahawalnagar, Okara (Khan *et al*, 1984) were 39.15, 49.76 and 48.96 at 7,10 and 14 months of age respectively. The proportion of lean increased by 8.95 percent at 10 months of age as compared to that at 7 months and then slightly decreased (1.80) percent) at 14 months of age. The fat issue increased by the increase in age and reached appreciable level at 14 month of ago. The proportion of bone and other tissues, however, decreased. The moisture and crude protein contents of lean meat decreased as the ago increased. The ash contents were found to be higher at 10 months and highest at 7 months of age.

Khan *et al*. (1984) further found that total edible and commercially valuable proportions were the highest at 10 months, being 14.64 and 4.13 percent more as compared to that at 7 and 14 months, respectively. It means that the best time for slaughter of Teddy goats was the age at 10 months.

MEAT MARKETING: In meat marketing, the abattoirs are the production points and butchers' shops are the only vending points to the consumers. The abattoirs are seriously lacking basic sanitation facilities (like light, adequate water supply, space for slaughtering and animal keeping, meat refrigeration, and disposal of offal) all over the country. A large portion of the by-products such as blood, glands, intestines, and bones are either wasted or poorly processed. The hygienic conditions of the slaughterhouses and meat shops are very poor. One of the underlying reasons is that these facilities were not periodically updated because of complex administratively procedures involved. The flayers and butchers are also not professionally trained. The fixing the prices of beef and mutton by local governments are serious obstacles in buying good quality animals for slaughtering.

The government butcheries at district/municipal level purchase animals from the local livestock market to fulfill the beef and mutton needs of people living in urban areas. The main merchants/contractors of meat purchase meat from these slaughterhouses/ butcheries. These meat merchants then sell the meat to beef and mutton whole seller. Then mutton and beef whole sellers channelize this meat to retailers. These retailers provide meat at retail shops to ultimate end users (consumers).

On the other hand, local butchers at village level purchase animals from their native livestock farmers. They slaughter these animals at their shops and directly provide to their customers. The local butchers can even purchase meat from the whole seller to run their business. There persists no market channel for the processed meat at commercial level.

Halal meat should, in fact, be a significant industry of the nation. Despite having a big meat industry, Pakistan's contribution of the global meat trade is modest, at just 2.9%. There is a Potential markets for halal beef exports. According to Halal Research Council (HRC), only exports 3 percent of its total meat production is being exported. Though, in Pakistan recently, the Halal Authority (PHA) was founded with the objective of developing a meat business based on exports in country. On the other hand, the international trade in halal food is about $3 trillion, including meat category with a $600 billion market share. As stated by Organization for Food and Agriculture (FAO), from 2001 to 2009 saw an increase in the worldwide beef meat trade of 10.4% on average, therefore there is a desire for Halal Middle East imports of beef.

MEAT PRODUCTION AND CONSUMPTION: Meat is regarded as a crucial nutrient for human survival and the production of energy. It contributes vitamins, minerals, protein, and lipids that are necessary and have a positive impact on wellbeing, making up a sizeable component of the usual diet around the world (Rehman *et al*., 2019).

Meat is a consumable meal that can be found in a variety of forms on the market. In the traditional economy, newly butchered animals' meat might be sold in packged form, stripped, or wet marketed and at demand without being chilled or processed (Brown,

Longworth, & Waldron, 2002; Zhou, Xu, & Liu, 2010). Meat from some indigenous species is made available through commercial meat production and diversification, which may be an important source of food (Hoffman and Cawthorn, 2013).There is evidence that sustained selection of increased lean meat output may negatively affect the quality of meat in other countries, despite the fact that meat breeding programmes around the world are focused on choosing fast-growing species and high production yields (Miar *et al.*, 2014; Swan *et al.*, 2016).

Despite having a significant population of animals, Pakistan's meat sector has unable to establish itself in the worldwide Halal meat market. Because it is commonly known that the current traditional meat production processes are inefficient, The production of meat is mainly seen as a by-product of the dairy sector. In addition, the low productivity per animal is contributing to the widening imbalance between supply and demand for mutton. To meet the rising demand for meat, productive animals like young female sheep and goats have been slaughtered at an early age. The increased export of meat has also made it less readily available to domestic customers, which has led to an increase in meat prices during the past ten years and is still continuing today (Ayyub *et al.*, 2011).

The most important source of high-quality protein, iron, and minerals for the people of Pakistan is meat and animal products. Meat and meat products are popular. increasing as a result of rapid population increase. The way that meat is traditionally arranged is not a good method. to satisfy the growing demand for premium beef, as seen by by a steady rise in price. The ideal response to a solution to this issue is to increase the productivity of meat. In Pakistan, red meat is typically a by-product of the dairy industry. Iqbal and Ahmad (1999) came at the conclusion several by-products, including wool, fats, butter, and leather goods play a crucial part in generating foreign currency in Pakistan needs to grow its economy ((Akram *et al.*, 2022).

In Pakistan, there is a 4.1 percent annual difference between the supply and demand for beef (PBIT, 2011). To compete in the global meat market Pakistan needs to increase its output in order to compete. Pakistani Because meat has a pleasant flavor, meat and meat products are popular. are exported to other nations, such as the Middle Eastern nations like Kuwait, Qatar, Bahrain, and the United Oman, the Arab Emirates, and so forth. The previous six years, Red meat output has been on the rise recently. the increase in annual meat production from 251,500t to 3232000t, with an average growth of roughly 4.8% every year 2006-12 (Bashir *et al.*, 2015).

The bulk of meat consumed in Pakistan is derived from cattle, buffaloes (beef & veal) and sheep and goats (Lamb and mutton). The meat production is related to the total livestock population, the number of animals slaughtered and quantity of dressed meat obtained from different animals.

The annual meat production from different categories of livestock is given below;

Table 3. Estimated Meat Production in (000 Tons).

Meat Type	2018-191	2019-201	2020-211
Beef	2,227	2,303	2,380
Mutton	732	748	765
Poultry meat	1,518	1,657	1,809
Total Meat	4,478	4,708	4,955

Source: **Livestock Division,** Economic Survey of Pakistan, 2020-21

Beef and veal are mainly low cost by-products of milk production and draught power. The young and well-nourished animals are considered too valuable to be slaughtered for meat production. The domestic beef prices have not been sufficient enough to provide an incentive to beef producers. The majority of buffalo calves either dies due to starvation or neglect or are slaughtered at a very young ago because the prevailing prices are too low to provide inducement for their better rearing and feeding. The animals destined for slaughter are usually old and culled and are not fed adequately. Therefore, the carcass yield and quality of meat is poor.

Meat is an important and preferred diet of the people of Pakistan. The per capita availability of meat is 21kg/annum (Economic Survey 2006-07). The per capita consumption, however, varies considerably between urban and rural population and from one tract to another according to the production of meat and density of population. The meat consumption also varies between different socio-economic groups as well as between individuals with in the household. The overall present availability of meat is, however lowest in the world and far below the standards of world health organization, which is 28 kg of meat per head per annum (FAO, 2004).

A wide gap, therefore, exists between the requirements and availability of meat. This situation is alarming and if priority is not given to the programmes relating to improvement of livestock for increasing the production of meat, the situation will become still worse.

These increases in meat production are possible if certain temporary and short term measures of fattening of old and very young animals are adopted. The permanent gains in the long run could come from improved health services, genetic make-up and improved nutrition of the breeding stock and meat animals. To attain the meat production potential as estimated above certain constraints such as lack of quality livestock feed absence of suitable technology, lack of production incentives and disorganized marketing of livestock and its products need to be removed (Khan *et al*., 2003).

When the animals attain the slaughter weight / age as desired by the farmer and consumer, they are transported from farm to slaughter house. Their condition may alter during shipping, impacting the meat's quality and quantity.. The existing transportation and marketing facilities are inadequate and insufficient to supply the services needed by livestock producers to properly handle and care for animals. The marketing system does not help the livestock producer to realize a reasonable return for his efforts and investment and there is little economic flow to the associate industries. There is an urgent need for some alteration to existing marketing systems of livestock with the object of increasing the net return to the producer (Khan *et al*., 2005).

The majority of Americans, or almost 59 percent of those surveyed, prefer to consume meat over vegetables and pulses, according to a Gallup survey. Furthermore, the results showed that despite meat is the most fundamental source of nutrition, only 52% of respondents said they prefer meat over vegetables, 37% said they prefer meat over pulses, and 10% said they prefer veggies over vegetables. Numerous changes have been observed in the nation's meat output over the years (Gallup Pakistan, 2009)

Table 4. World Red Meat Production: Countries Wise Ranking.

	World	61,583,000	
Ranks	**Country**	**2018**	**% of World**
10	Turkey	1,700,000	2.76%
9	Pakistan	1,780,000	2.89%
8	Mexico	1,910,000	3.10%
7	Australia	2,065,000	3.35%
6	Argentina	2,760,000	4.48%
5	India	4,250,000	6.90%
4	China	7,070,000	11.48%
3	European Union	7,875,000	12.79%
2	Brazil	9,500,000	15.43%
1	United States	12,086,000	19.63%

Source: U.S. Department of Agriculture, Foreign Agricultural Service, Livestock and Poultry: World Markets and Trade, annual. http://www.fas.usda.gov/currwmt.asp, Internet release 2010.

Source: (Akram *et al.*, 2022)

Future trends include a rise in population, an increase in protein and calcium consumption, and very high rates of interest in meat products (Farooq *et al.*, 2004; Sharif and Farooq, 2004). Pakistan has enormous potential, but has not yet had the ability to use its vast animal population for economic gain and is becoming a significant player in the global meat business (Anonymous, 2006). Pakistan additionally exports live animals to other countries for US$13.95 income potential from export (Anonymous, 2009-10).

The livestock industry is essential to agriculture. This industry employs about 35 million people and contributes roughly 11% of the GDP (Simon, 1980). Additionally, it is crucial for the Pakistani government to broaden its focus to include livestock and dairy products in order to promote agriculture. Meat is a very significant product that is a significant source of high nutrients, proteins, and fibre content; it is considered to be a basic component of human nutrition. Due to the ancient approach, the production of red meat does not match the standards, and because of the outdated traditions, there are no incentives for the producers to provide high-quality meat. Issues stem from inadequate infrastructure, outdated slaughterhouses, and the and the delivery of meat with no price structure (Iqbal *et al.*, 2000).

The need for low prices of meat for low income consumers could be better met by encouraging much greater production of meat and allowing price premiums for the more desirable cuts of the carcass. This would result in a greater supply of highly nutritious meat. The less premium cuts of meat could be sold at a relatively low cost to the low income consumers.

Indeed if animals were not slaughtered for meat it might still be necessary to kill them for getting organs such as liver, pituitary, etc. as these provide many enzymes, hormones and organoleptic products, essential for maintaining and regulating human health. Other parts of the animal (skin, hides, pelts and wool) find their way into articles of daily necessities. Blood and other constituents of carcass (bone, meat scraps, intestinal

contents, fat, etc.) are made into bone and meat protein meals, sausage casings, etc. for feedstuffs, and fertilizer meal for agriculture and edible fats etc.(Akram *et al.,* 2022)

In countries where meat industry is established on sound footing, the utilization of edible, pharmaceutical and non-edible by-products of slaughter house has become an industry in itself. In Pakistan, however, considerable quality of these by-products goes waste or is under-utilized. The proper sale of by-products can result in a lower price of meat since income from these sales will help defray the cost of running the slaughter houses.

CONSTRAINTS OF MEAT INDUSTRY IN PAKISTAN: At present, the livestock production and meat business are in the hands of generally poor, illiterate persons who lack modern know-how. Training facilities for the farmers in the basic practical methods of animal production and care are virtually non-existent. Slaughter men, meat inspectors and butchers are not conversant with meat technology. Correct training of all persons connected with meat production is essential for getting the benefits of modern scientific developments.

Primitive methods are used in livestock farming. The yield of milk and meat is scanty. Traditional methods of marketing, slaughtering, and selling meat result in substantial losses of by-products and the distribution of unsanitary products to customers at ever-increasing prices. Unless modern methods of livestock production, marketing slaughter and supply are introduced, the situation of meat may become still worse.

Meat production in Pakistan is a sideline enterprise, the potentiality of which has not yet been fully exploited. The beef and mutton production are low cost by-products of dairy production and draught power and from free range land and stubble grazing. The role of cattle and buffalo in meat production is rather secondary, because these are essentially reared for milk production and draught power.

The absence of a suitable carcass grading system and an organized marketing system of meat are some of the major hindrances in the development of meat industry in this country. Standardized carcass grading system based on age, sex, carcass weight / length and fat thickness, suitable to local market, should be evolved. Carcass grading systems, if enforced, can benefit the producers by greater demand which would result in incentives for the better and well nourished livestock, meat traders and retailers by the more efficient handling of well classified units and thus by increased turnover and consumers by being able to select the quality they want. The development of carcass grading system along with price variation for various meat qualities and cuts of meat would encourage meat production.

At present, the livestock production and meat business are in the hands of generally poor, illiterate persons who lack modern know-how. Training facilities for the farmers in the basic practical methods of animal production and care are virtually non-existent. Slaughter men, meat inspectors and butchers are not conversant with meat technology.

The marketing, slaughter and sale of meat are done on traditional lines resulting in large losses of by-products and supply of unhygienic stuff to the consumers at increasingly higher prices. Unless modern methods of livestock production, marketing slaughter and supply are introduced, the situation of meat may become still worse.

Retail prices of meat are fixed without ensuring supply of animals at the slaughter houses at the right prices. The current price levels are not as high as the cost of producing meat under existing conditions. The result is that no big investor ventures to enter the meat business and all sorts of malpractices are rampant in the market.

The majority of the prior material that was available concentrated on evaluation of the cattle sector as a whole (Iqbal and Ahmad, 1999; Chaudhry *et al.*, 1999; Nadeem *et al.,* 2012; Hasnain and Usmani, 2006; Rehman *et al.,* 2017). Similar to that, there is scant literature on Pakistan's potential for the meat industry and trade prospects (Qureshi *et al.* 2012; Sohaib and Jamil, 2017). These studies, however, omitted a comprehensive analysis of Pakistan's patterns and growth in meat production and export.

National Commission on Agriculture clearly emphasized that “one of the main reasons for the lack of development in the livestock sub-sector is the exceeding defective system of marketing of livestock and livestock products”. Realizing the importance of the issue, a nationwide study was carried out, with the assistance of FAO Pakistan, to investigate the marketing of live animals and their products in the country. Besides marketing of live animals, the selling system of different livestock products like milk, meat, wool, hides and skins were investigated.

By crossing British mutton breeds of sheep such as down breeds it should be possible to evolve new breeds which may have the ability to gain weight quickly and developing a meaty carcass in a short time under local environmental conditions. In fact, some new breeds of sheep such as Polworth and Corriedale which are dual purpose mutton and wool) have been developed in Australia and New Zealand by crossing native breeds with British down breeds.

No systematic studies have been made to evolve meat breeds of different categories of local livestock in Pakistan. Some authors have classified different categories of Pakistani livestock into various breeds on the basis of their external distinguishing features and other characteristics. A brief description of various breeds of cattle, buffaloes, sheep and goats found in Pakistan and their performance with respect to meat production is given in the ensuring lines.

RECOMMENDATIONS: Creation of a Livestock Marketing Regulatory Authority is recommended to ensure good governance in marketing of livestock and livestock products; Practicing of SPS measures in production and marketing of milk and meat marketing; Provision of milk pasteurization and chilling facilities in deep rural areas, and hides/skins processing facilities in NWFP and Balochistan. The most pragmatic solution to meet the growing demand of meat and meat products is to increase the productivity of our existing animal resources. Feedlot fattening can result in quantum leap in meat production and within a short span of 90-100 days the carcass weight can practically be doubled under this system. Thus, establishment of feedlot fattening forms provide an attractive option to meet the growing demand of beef and mutton in Pakistan. The Government policies about livestock should be farmer friendly in particular the small farmer. Promote and facilitate processing of meat & meat products. Encourage private sector investment in meat production. Undertake capacity building of all stakeholders. Facilitate and promote the development and dissemination of improved technologies. Meat and meat products require a well-organized marketing system. Farmers' training on various areas of meat production should be bolstered and made a regular occurrence. Meat animal marketing cooperatives. Meat production and processing that is integrated.

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