

## Primary Variations and Outlook of Livestock Production

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### Abstract

Globally, the livestock industry is very dynamic. It is changing in developing nations as a result of the quickly rising demand for animal products. While many production processes are becoming more efficient and environmentally sustainable, the market for cattle products is stagnating in affluent nations. The demand for livestock products has historically changed as a result of changes in human population, income, and urbanisation. The production response in various livestock systems has been correlated with advances in science and technology as well as increases in the number of animals. Competition for natural resources, notably land and water, competition between food and feed, and the requirement to function in a carbon-constrained economy will all have an increasing impact on productivity in the future. The potential for increased production, increased efficiency, and genetic advances will continue to be influenced by advancements in breeding, nutrition, and animal health. Regulations governing the environment, animal welfare, and carbon emissions are projected to have an increasing impact on livestock production. Future demand for livestock products may be significantly tempered by socioeconomic variables like concerns about human health and shifting sociocultural norms. Regarding how these forces will manifest themselves in various parts of the world during the ensuing decades, there is a great deal of ambiguity.

**Keywords:** Animal products; Urbanisation; Livestock systems; Carbon emissions

### Introduction

Livestock systems are a huge worldwide asset with a value of at least \$1.4 trillion and occupy around 30% of the planet's ice-free terrestrial surface area [1]. Long market chains that employ at least 1.3 billion people worldwide and directly sustain the livelihoods of 600 million impoverished smallholder farmers in developing nations are increasingly organised in the livestock sector. Keeping livestock is a crucial risk reduction approach for communities that are at risk, because animals are crucial nutrient and traction sources for smallholder systems' crop growth. Worldwide, consumption of protein and calories from livestock products respectively accounts for 33% and 17% of total calorie consumption, respectively, but there are significant regional variations.

The natural resource base, public health, social equity, and economic growth are all impacted by livestock systems in both positive and bad ways. Livestock is currently one of the agricultural subsectors in emerging countries that is expanding at the fastest rate [2]. It already accounts for 33% of the agricultural GDP and is growing significantly. The demand for animal products, which is rising quickly due to population growth, urbanisation, and rising affluence in developing nations, is what's fuelling this growth.

Between emerging and established nations, there is a contradiction in the world's livestock industry. Between 1980 and 2002, the amount of meat produced in the developing countries more than tripled, from 45 to 134 million tonnes [3]. The main drivers of this growth-poultry and pigs-were centred in nations that saw fast economic expansion, especially in East Asia. On the other hand, although being at high levels, output and consumption of animal products are currently only rising slowly or stagnant in industrialised countries [4]. However, 53% of the agricultural GDP in developed nations is accounted for by the production and sale of cattle. Given that the majority of demand is currently satisfied by domestic production and is expected to do so for the foreseeable future, the combination of rising demand in developing nations and stagnant demand in industrialised nations represents a significant opportunity for livestock keepers in these nations.

Agricultural production needs to be raised, but it must be done in a way that benefits the less fortunate and has a minimal negative impact on the environment.

This essay aims to provide a concise overview of the current situation of livestock production systems internationally in connection to recent trends and a quick assessment of the likelihood that these patterns will persist going forward. The main factors that have contributed to past gains in livestock output along with the status of intensive and extensive production systems in developed and emerging countries. The scientific and technological developments that have led to historical increases in livestock output and highlights untapped potential in areas like livestock nutrition, disease control, and genetics [5]. The rivalry for land and water, climate change, the influence of socio-cultural drives, and ethical concerns are just a few of the variables that could alter both the production and consumption of animal products in the future. The section concludes with a brief discussion of three "wildcards" chosen somewhat arbitrarily, that could significantly alter future trends in livestock production and consumption: artificial meat, nanotechnology, and deepening social concern over new technology. An overview of the future evolution of livestock production systems and some of the major uncertainties are included in the paper's conclusion.

### Evolutionary Patterns in Livestock Production

#### Increased interest in livestock products

The projected human population in 2050 is 9.15 billion, with a

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range of 7.96 to 10.46 billion. The majority of the growth is anticipated to occur in developing nations. By the late 2040s, East Asia will no longer be experiencing positive population growth. In comparison, the population of sub-Saharan Africa will continue to rise at a rate of 1.2% year. Even if the global population stops expanding at some point in the current century, rapid population growth may still be a significant obstacle to improving food security in some nations. Urbanization is a significant role in determining food demand. Urbanization rates range from less than 30% in South Asia to close to 80% in developed nations and Latin America as of the end of 2008, with more people living in cities than in rural areas [6]. Urbanization will experience extraordinary increase over the coming decades, especially in Africa and Asia. Urbanization frequently spurs improvements in infrastructure, particularly cold chains, which allows for greater trading of perishable items. This has a significant impact on patterns of food consumption in general and on demand for cattle products in particular. Income growth is the third factor influencing the rise in demand for livestock products. The annual growth rate of the world's per capita income was 2.1% between 1950 and 2000. Spending on livestock products increases along with income. Future economic growth is anticipated to persist, often at rates between 1.0 and 3.1 percent. It is anticipated that industrialised country growth will be less rapid than that of developing economies.

In particular between locations, differences in the intake of animal products are substantially bigger than those in the total amount of food available. In sub-Saharan Africa and South Asia, the food demand for animal products will almost quadruple, rising from around 200 kcal per person per day in 2000 to over 400 kcal per person per day in 2050 [7]. Conversely, levels of consumption will barely change in the majority of OECD nations that already consume a lot of calories from animal products, but they will rise to OECD levels in South America and the former Soviet Union.

Globalized diets are increasingly being catered for in the agriculture producing sector. As urban customers demand more processed foods, the role of agribusiness will rise over the next few decades. Retailing through supermarkets is growing at a rate of 20% per year in nations like China, India, and Vietnam.

### Modification in consumption of livestock production for future response

Competing for limited resources: Only 2.5% of the world's water resources are freshwater making them comparatively rare (MA 2005). Between 1.5 and 3 billion people rely on groundwater for drinking, and in some areas, water tables are steadily falling. Groundwater also plays a significant role in the provision of water. By 2025, 64% of the world's population, up from 38% currently, would reside in water-stressed basins. Future increases in livestock populations will undoubtedly increase the need for water, especially for the manufacture of livestock feed, which can range from 0.5 kilogramme in North American grasslands to 5 kg in some tropical ecosystems in one cubic metre of water [8]. There are several ways to start increasing the global water productivity of livestock, including increasing the use of crop by products and residues, regulating the spatial and temporal distribution of feed supplies to better match supply with demand, and managing systems to conserve water. To ensure that livestock production in the future contributes to the sustainable and effective use of water resources, more study is required on the interactions between livestock and water and integrated site-specific treatments.

Climate change: The worldwide cattle industry may be

significantly impacted by climate change. Different aspects of livestock production systems will be impacted, and productivity adjustments are unavoidable. Undoubtedly, rising climate variability will make it more difficult for farmers to manage the risks associated with animal production. In addition, cattle food chains contribute significantly to greenhouse gas emissions, potentially 18% of all anthropogenic emissions [9]. Agriculture has not yet been a significant factor in the reduction of greenhouse gas emissions since it provides relatively fewer cost-effective solutions than other industries like electricity, transport, and buildings. This will change in the future, though careful analysis will be needed to provide direction. For instance, livestock consumption patterns in one nation are frequently linked to changes in land use in other nations, so these patterns must be taken into account when performing national greenhouse gas accounting exercises.

Even slight rises in the average temperature will have serious negative effects on many tropics and subtropics regions. Contrary to many areas of the temperate zone, agricultural productivity is projected to increase slightly in mid- to high latitudes for increases in local mean temperature of 1-3°C [10]. A growing body of research is being done on adaptation strategies, such as innovative approaches to exploiting weather data to help rural communities manage the risks brought on by rainfall variability and the development and testing of livestock insurance programmes that are weather-indexed. The viability of particular adaption options depends on a variety of circumstances and geographic areas. To lessen vulnerability to future climate change, more widespread adaptation is required. However, this comes with costs, restrictions, and other difficulties.

### Conclusion

Approximately as old as our relationship with domesticated plants, it is believed that humans and domesticated animals have been together since roughly 10,000 BC. Although this association is under stress and going through change on many fronts, it is unclear what the next century has in store for it. Although the global cattle industry may experience significant change in the future, it is still vital to the welfare of millions, if not billions, of people since, at this point in history, there is no known, practical equivalent in many developing nations.

### Conflict of Interest

None

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