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**Report Name:** India's FMD Status and its Water Buffalo - Carabeef Trade  
Update 2023

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**Report Highlights:**

India is the world's largest producer of carabeef, a meat derived from the Asian water buffalo (*Bubalus bubalis*). Carabeef is one of India's largest agricultural exports. All data reported herein is carcass-weight-equivalent (CWE). In calendar year (CY) 2022 (January-December), India exported 1.44 million metric tons (MMT) of carabeef (\$2.9 billion), accounting for 33 percent of its production; making India globally the fourth largest exporter of red meat. To date in CY 2023 (January through May) India has exported 0.59 MMT of carabeef (\$1.22 billion), down four percent compared to the 0.61 MMT (\$1.25 billion) reported at the same period in 2022. In 2023, India's carabeef production is expected to reach 4.4 MMT. Notwithstanding high production volumes, the Indian water buffalo herd is susceptible to various disease outbreaks, including foot-and-mouth disease (FMD) among others. FMD in India impedes carabeef exports to most of the world's high-income markets, including the United States.

## EXECUTIVE SUMMARY

India is the world's largest producer of water buffalo meat (i.e., carabeef). Water buffalo meat is the meat derived from the Asian water buffalo (*Bubalus bubalis*).<sup>1</sup> In calendar year (CY) 2023 (January-December), FAS New Delhi (Post) projects India's carabeef production at around 4.4 million metric tons (MMT) on a carcass-weight-equivalent basis (CWE).<sup>2</sup> All data reported herein is in CWE.

Carabeef is one of India's main agricultural export commodities. In CY 2022, India exported about 1.44 MMT of carabeef (\$2.9 billion), accounting for about 33 percent of its production; making India globally the fourth largest exporter of red meat. To date in CY 2023 (January through May), India has reportedly exported some 0.59 MMT of carabeef (\$1.22 billion), down nearly four percent compared to the 0.61 MMT (\$1.25 billion) reported at the same period in 2022.

Notwithstanding strong production numbers, Indian livestock remains exposed to and afflicted by various livestock diseases, including foot-and-mouth disease (FMD). As a result, India lacks market access for its carabeef exports to several high-income countries such as the United States.

Several countries, including the United States, ban the import of carabeef from those states classified as being FMD-endemic by the World Organisation for Animal Health (WOAH). In fact, nearly three-quarters of India's carabeef exports go to those trade partners that are themselves classified by the WOAH as being FMD-endemic.

Notwithstanding that since 2003 formal FMD control programs are ongoing in India; the outreach of these programs has not been sufficiently successful enough to control foot-and-mouth disease. Under a 2019 program – the National Animal Disease Control Program (NADCP) – India targets controlling FMD with vaccinations by 2025, with the eradication of the disease by 2030. Under current conditions the WOAH and the U.S. Department of Agriculture (USDA)/Animal and Plant Health Inspection Service (APHIS) cannot recognize India as FMD-free.

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<sup>1</sup> Asian Water buffalo meat is known as well as carabeef (or buff) in India; it is marketed under various other names in different countries. In some markets it is known also as red beef. Carabeef derives from the Spanish language and the breed's name of carabao. The Asian water buffalo is a large bovid originating in the Indian subcontinent and Southeast Asia; it is domestically raised for its milk and meat in several countries (India, Nepal, Pakistan, Bangladesh, Philippines, Bulgaria, Italy, Russia, Czech Republic, Slovakia, Australia, and Egypt).

<sup>2</sup> See, [GAIN-INDIA | IN2022-0075 | India - Livestock Products Annual – 2022](#).

## COMMODITY

### CATTLE – BOVINE DAIRY AND WATER BUFFALO

#### PRODUCTION

India has the world's largest live cattle inventory, followed by those of Brazil and China in terms of absolute numbers. The national cattle herd is composed of a combination of bovine dairy cattle (*Bos taurus* and *B. indicus*) and the Asian domestic water buffalo (*Bubalus bubalis*). FAS New Delhi (Post) estimates that the total cattle (bovine dairy plus water buffaloes) herd number at about 307.5 million head in 2023 as compared to 306.7 million head in 2022.<sup>3</sup> Post attributes the increase in overall herd numbers resulting from a healthy calf-crop, driven by improving dairy cattle (which includes also female buffaloes) reproductive success.

Industry and government sources anticipate that India's cattle herd will experience robust growth over the next few years, thanks to improved breeding, nutrition, and animal health. With the improvement in the reproductive health of animals, calf crop numbers will gradually march upwards. India, in the 2019 census (latest edition) reports that the national cattle herd stands at approximately 302.3 million head; composed of around 192 million head of head of bovine dairy (*B. taurus* and *B. indicus*) and roughly 110 million head of Asian water buffalo.<sup>4</sup> The USDA official CY 2019 Indian cattle herd number is 302.7 million head (bovine dairy cattle plus water buffaloes). Post estimates that in 2023, that the Indian cattle herd of 307.5 million head is composed of some 194.2 million bovine dairy cattle and 113.3 million water buffaloes.

Most dry water buffaloes (i.e., cows) are normally sold off to India's buffalo meat industry. Slaughter of cattle (*B. taurus* and *B. indicus*) is very limited; restrictions abound with most Indian states forbidding bovine dairy cattle slaughter (see, [GAIN-INDIA | IN5085 | India - Cattle Slaughter Legislations – July 7, 2015](#)).<sup>5</sup>

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<sup>3</sup> India's A1 milk producing cow breeds (crossbreed – *B. taurus*) include largely Holstein Friesian, Karan Swiss, Jersey, and Brown Swiss. Whereas India's A2 milk producing cow breeds (pure desi breed – *B. indicus*) include the Gir, Sahiwal, Red Sindhi, and the Kankrej. The zebu, also known as indicine cattle or humped cattle, is a species or subspecies of domestic cattle originating in the Indian sub-continent. The zebu has a fatty hump on its shoulders, a large dewlap, and often drooping ears. Used often in the past as a draught animal, crossbreeding with foreign imported breeds has led to the increased incidence of smaller humps in bulls and bullocks (steers), reducing their value as draught animals. Key physiological differences that *B. indicus* and *B. taurus* cattle evidence include delayed age at puberty along with higher circulating concentrations of hormones such as estradiol, progesterone, insulin, and IGF-I. Overall reproductive success of *B. indicus* animals is inferior to that of *B. taurus* ones. However, *B. indicus*, is heat tolerant and parasite resistant, making it better adapted to India's hot, humid climatic conditions. These animals can be used for both meat and milk production; however, meat quality characteristics vary and milk its milk production is not necessarily very high.

<sup>4</sup> Out of the 192 million head of cattle, it is estimated that around 51 million head are foreign (exotic) introduced and or crossbred animals; 142 million head are indigenous (*B. indicus*)/ non-descript. Goats, sheep, and pigs represent about 232 million bovid animals.

<sup>5</sup> Article 48 in the Indian Constitution suggests that states should consider preventing cattle slaughter but provides no specific enforceable laws or directives on the subject. Agricultural policy, including cattle slaughter, is governed individually by each Indian state. Many Indian states and union territories address cattle slaughter and the interstate movement and trade of live cattle and animal products. However, because there are no central or federal laws for cattle

**Asian Domestic Water Buffalo (*Bubalus bubalis*)**



Source: FAS New Delhi.



Source: FAS New Delhi.

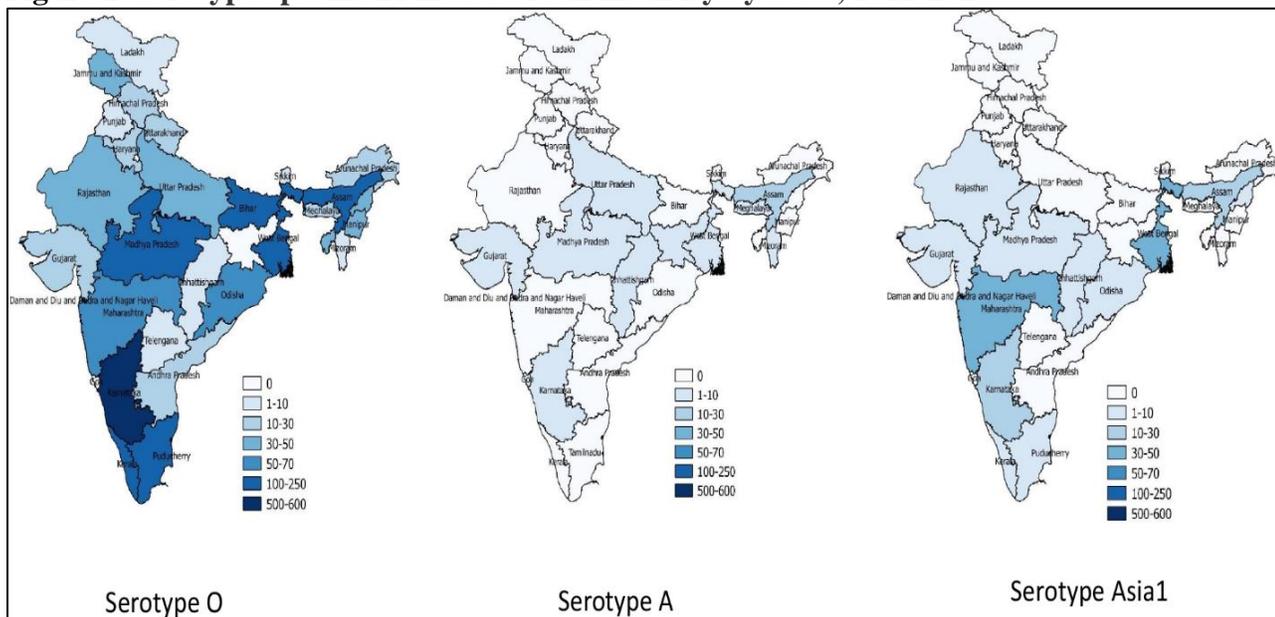
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slaughter, most states and union territories have developed dissimilar legislation, including creating different legal definitions for calves, bulls, and bullocks (steers).

**Animal Disease, India's Struggle with Foot-and-Mouth Disease (FMD):** Endemic in most parts of the world, FMD is a severe and highly contagious viral disease.<sup>6</sup> In India it causes illness in bovine dairy cattle, water buffaloes, pigs, sheep, goats, deer, and other animals with divided hooves.<sup>7</sup> Although not a public health or food safety threat, FMD causes production losses and hardships for farmers and ranchers. FMD has mortality and morbidity rates of five and 100 percent respectively.

Foot-and-mouth disease is a worldwide concern as it can spread quickly and cause significant economic losses. It is endemic in India, where it has led to reduced milk yields and livestock losses that include increased infertility, reduced steer working capacity, and higher mortality among young and production losses in adult livestock.<sup>8</sup> The virus spreads via direct contact with breath, saliva, urine, and other contaminated excretions of infected animals where it can survive for several months. The virus is also spread by fomites, mechanical vectors, and serves as an environmental contaminant. The trade in infected animals and their products can exacerbate the spread of foot-and mouth disease.

**Figure 1: Serotype-specific FMD Outbreak Intensity by State, 2011-2020**



Source: National Library of Medicine, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9527732/>.

India is not among the 61 **FMD-free** countries.<sup>9</sup> The FMD virus has seven serotypes: A, O, C, Asia 1, and SAT 1-3 types, and 60 subtypes. India currently reports the presence of serotypes A, O, and Asia 1.

<sup>6</sup> Other diseases prevailing in India that afflict bovine dairy cattle and water buffaloes include brucellosis, bovine anaplasmosis, contagious bovine plural pneumonia, bovine viral diarrhea, bovine leukosis, infectious bovine rhinotracheitis, Malignant Catarrhal fever, Johne's Disease, Leptospirosis, Listeriosis, Colibacillosis, Salmonellosis, lumpy jaw, wooden tongue, vesicular stomatitis, Ephemeral fever, pseudo rabies, cow pox, rabies, babesiosis, theileriosis, toxoplasmosis, dermatophytosis, aflatoxicosis, Epizootic abortion, black leg, lumpy skin disease, anthrax, hemorrhagic septicemia, and tuberculosis.

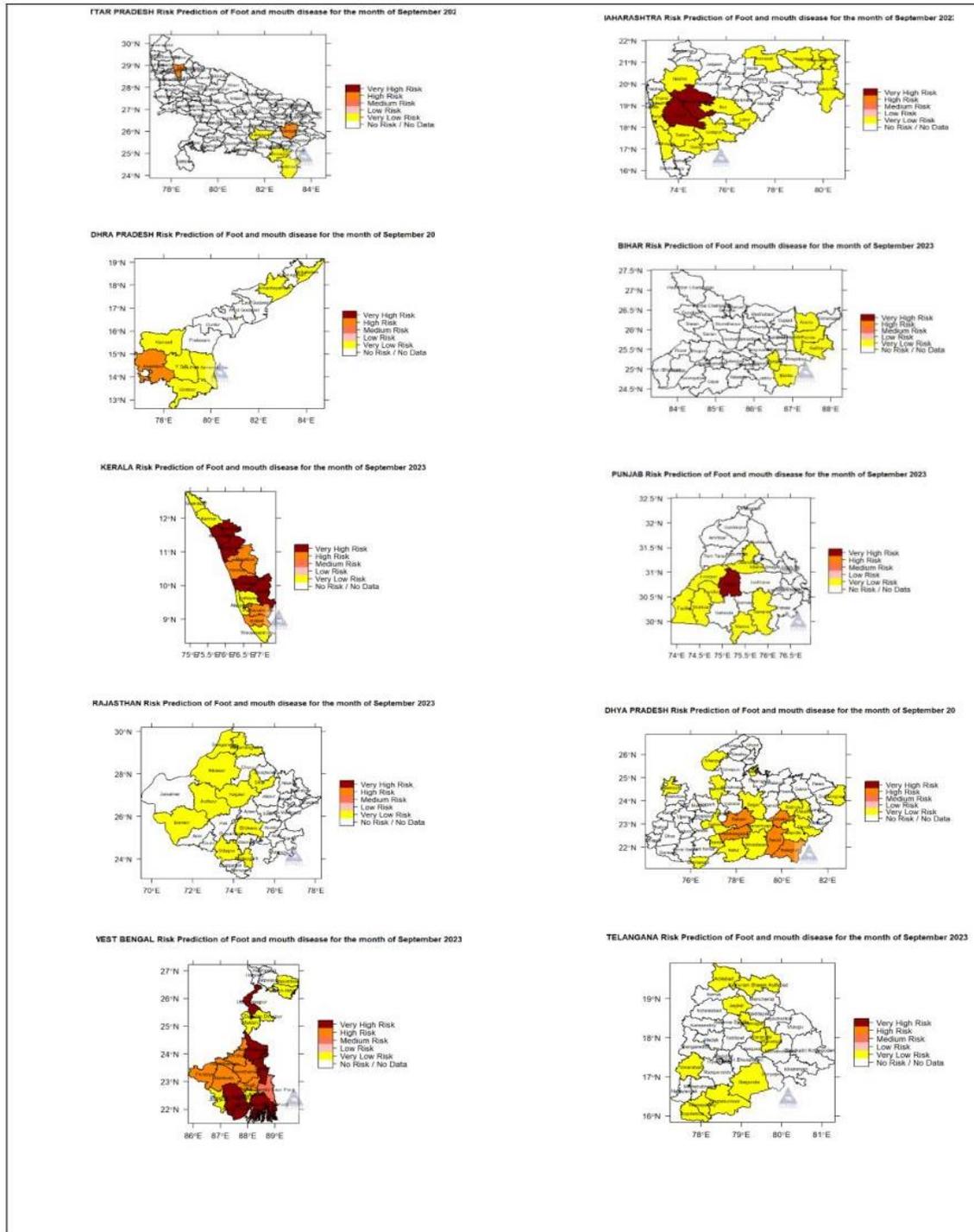
<sup>7</sup> The Bovidae form the biological family of cloven-hoofed, ruminant mammals. These includes bovine cattle, bison, buffaloes, antelopes, and caprine animals. An animal of this family is referred to as a bovid.

<sup>8</sup> Reportedly foot-and-mouth disease entered India in 1864.

<sup>9</sup> See, USDA-APHIS, Animal Health Status of Regions, <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-and-animal-product-import-information/animal-health-status-of-regions>.

Immunity against one serotype does not protect an animal against other types or subtypes. Considering India's large herds of bovine dairy, water buffalo, and feral cattle and swine, local livestock remains highly susceptible to repeated FMD outbreaks. Among India's top 10 carabeef production states, FMD outbreak risk is being anticipated in the month of September 2023, in varying extent.

**Figure 2: India, Projected September 2023 FMD Outbreaks, Carabeef Production States**



Source: NADRES, ICAR-NIVEDI, [https://www.nivedi.res.in/Nadres\\_v2/](https://www.nivedi.res.in/Nadres_v2/), FAS New Delhi office research.

## POLICY

**Policy Action - India Aims to Become FMD-Free:** In 2003-2004, India initiated a Foot-and-Mouth Disease Control Program (FMD-CP) in 54 districts (nine percent of the then total districts). The program was extended to 221 districts in 2009-2010, and in 2012 became a pan-India program.

The FMD-CP has not achieved full-control and/or eradication of FMD. The program fell short primarily because the vaccination program was implemented in a staggered fashion, covering only a few districts during a period; secondly, the vaccinations were subsidized but not free of cost; and thirdly, the program covered only large ruminants (e.g., bovine dairy and buffaloes) even though small ruminants and pigs are also carriers of the virus.

In 2019, the Indian government initiated the National Animal Disease Control Program (NADCP) – a WOAHA-endorsed five-year nation-wide project with an outlay of Indian rupees (INR) 133.4 billion (~\$1.8 billion).<sup>10</sup> The NADCP targets control of FMD in India through vaccinations by 2025; and with FMD eradication by 2030. The program aims to vaccinate all ruminants and pigs and involves:

- Vaccination at intervals of six months
- Creating public awareness
- Ear-tagging and registration of animals for traceability
- Monitoring and control
- Pre-vaccination deworming
- Maintaining vaccination records through an animal health card
- Outbreak investigations, and
- Virus isolation, pre- and post-vaccination testing, impact evaluation of the program, and regulating movement of animals.

Challenges to the FMD control programs in India include multiple serotypes, shortcomings in the ability to perform molecular diagnostics to identify phylogeny of current viruses, large herd size, social stigmas, and lack of potent and stable vaccines. Also, the internationally widely practiced policy of [test and kill is not common](#) due to socio-cultural reasons. FMD is prevalent, even in vaccinated herds.

**Foot-and-Mouth Disease Status:** The WOAHA evaluates a country's FMD-status based on several factors. These include veterinary infrastructure, disease control program, vaccination status, animal movement, livestock demographics, surveillance activities, diagnostic and laboratory capabilities, and emergency response capacity.<sup>11</sup> The WOAHA recognizes a country/zone as FMD-free only after 200-days from the last case reported without vaccination.

The United States also evaluates the FMD status based on additional factors. A country is recognized FMD-free only after 429-days from the last case. The U.S. government delineates formal rules and regulations to prevent ingress of foot-and-mouth disease into the United States. Regulations in title 9 Code of Federal Regulations Part 94 prohibit the import of certain animals and animal products.

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<sup>10</sup> See, Ministry of Fisheries, Animal Husbandry and Dairying/Department of Animal Husbandry and Dairying, National Animal Disease Control Program (NADCP) located at <https://dahd.nic.in/schemes/programmes/nadcp>. U.S. dollar 1.00 = INR 71.29 (December 31, 2019).

<sup>11</sup> India is taking the path of complete vaccination of animals as a precursor to becoming an FMD-free country.

## COMMODITY

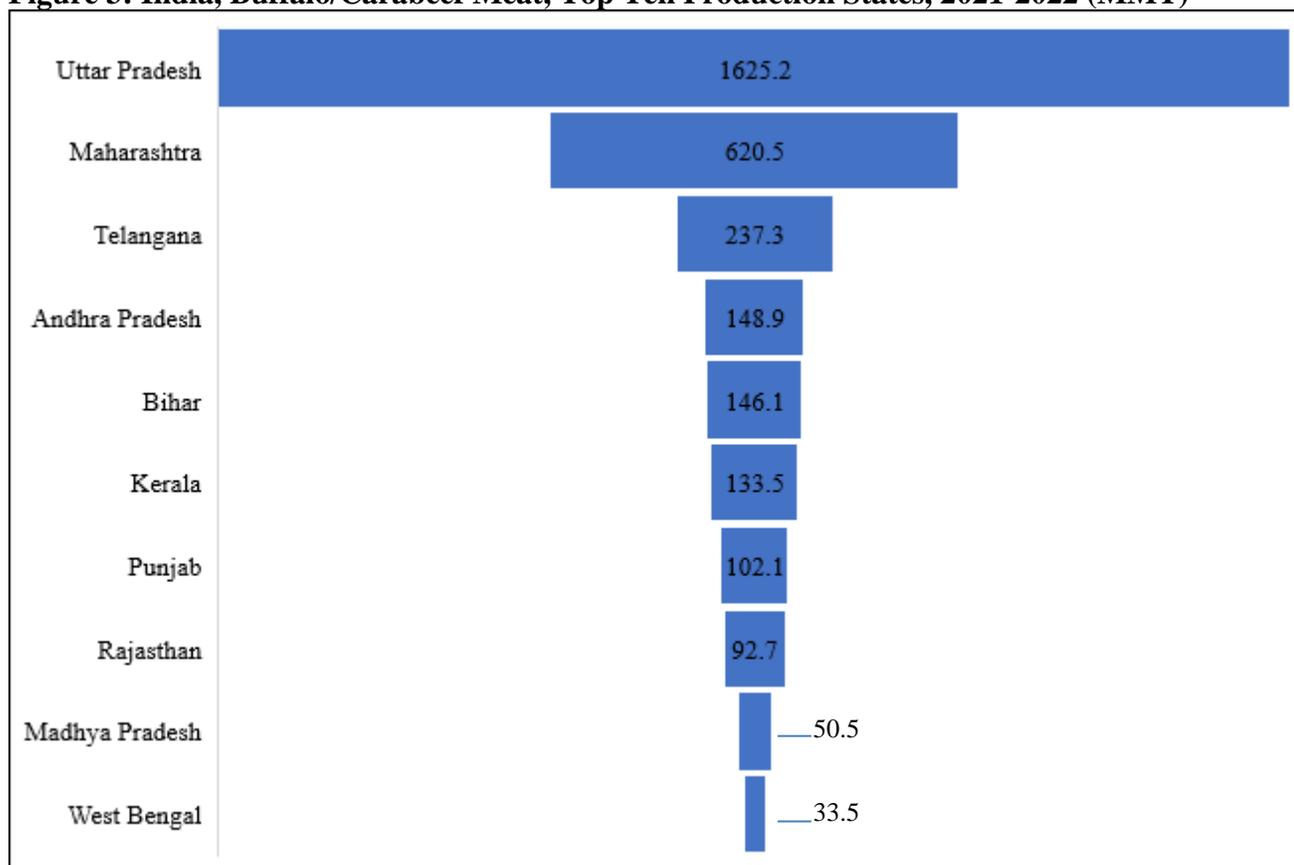
### WATER BUFFALO MEAT, BEEF AND VEAL

#### PRODUCTION

FAS New Delhi foresees India's CY 2023 carabeef production reaching 4.4 MMT, making the country the world's fourth largest exporter of red meat.

India's carabeef production is growing thanks to increased demand from overseas markets for affordable animal protein.<sup>12</sup> Domestically, increased demand from Indian consumers is growing because of changing lifestyles, shifts in dietary patterns, growing supplementary sales channels, increasing urbanization, greater cultural diversity, and disposable incomes.

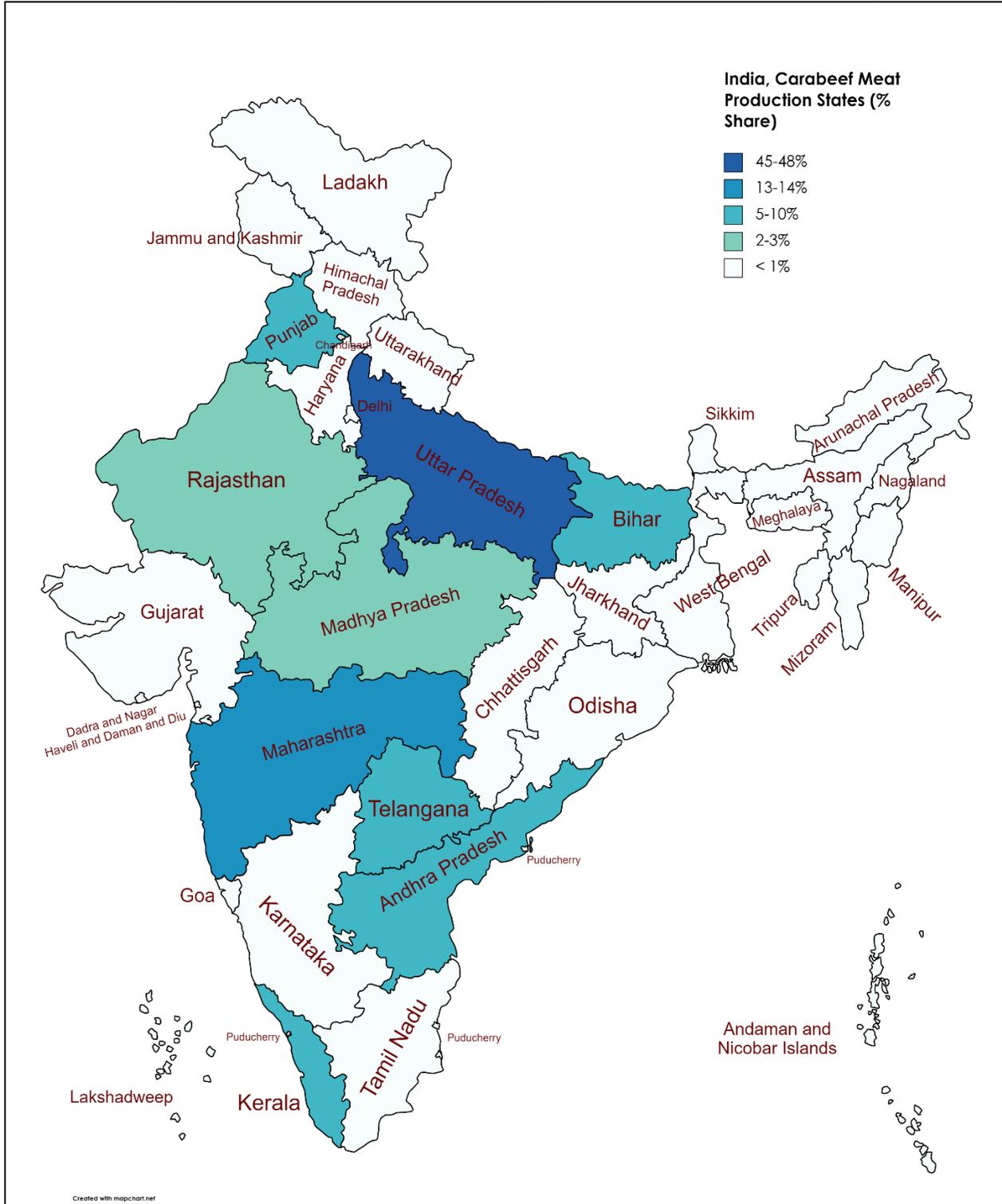
**Figure 3: India, Buffalo/Carabeef Meat, Top Ten Production States, 2021-2022 (MMT)**



Source: STATISTA, FAS New Delhi office research.

<sup>12</sup> The [OECD-FAO](#) foresees a 14 percent increase in global consumption of meat proteins by 2030. They expect beef to represent 20 percent of all protein from meat sources.

**Figure 4: India, Buffalo/Carabeef Production Sites, 20<sup>th</sup> Livestock Census (2019), Projections**

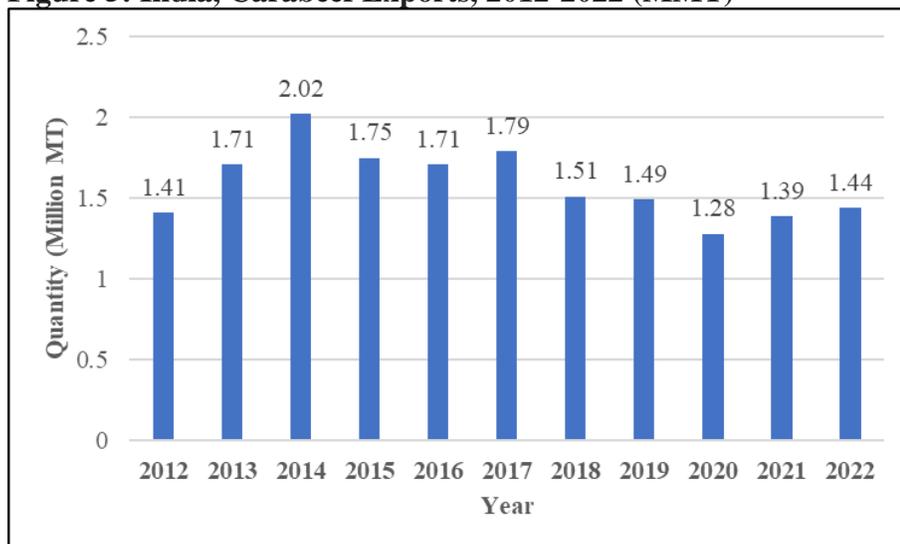


Source: Ministry of Commerce and Industry/Agricultural and Processed Food Products Export Development Authority (APEDA): FAS New Delhi office research.

## TRADE

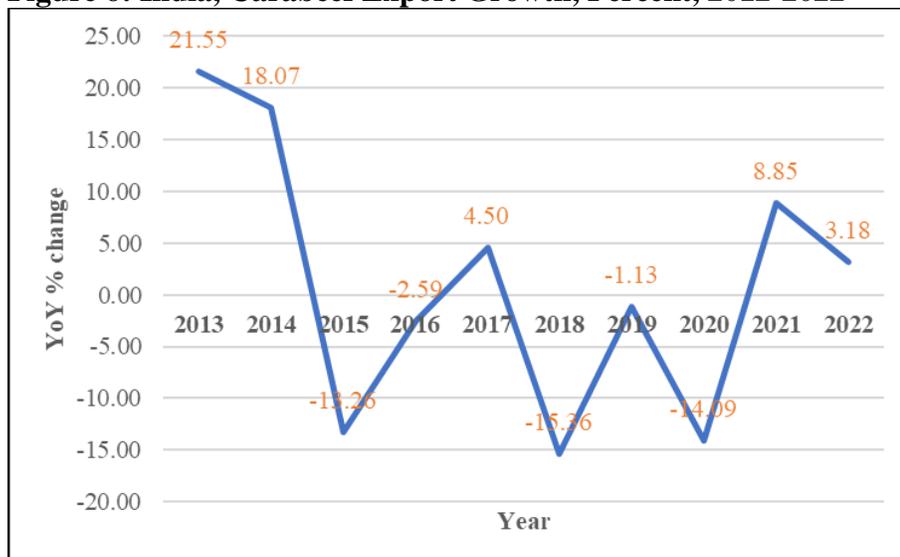
**Demand for Affordable Animal Protein Drives Carabeef Export Growth:** Carabeef is one of India's major food and agricultural product exports. India's carabeef exports are benefitting from foreign markets' demand for more affordable red meat. India today ships carabeef to some 60 countries worldwide. Increases in trade volumes are being brought about by a steadily growing water buffalo herd combined with export-oriented slaughterhouses actively tapping into overseas demand for carabeef. In CY 2022, India's carabeef exports exceeded 1.44 MMT (carcass-weight-equivalent), with a reported value of \$2.95 billion.

**Figure 5: India, Carabeef Exports, 2012-2022 (MMT)**



Source: Trade Data Monitor; FAS New Delhi office research.

**Figure 6: India, Carabeef Export Growth, Percent, 2012-2022**



Note: Growth based on change in quantities.

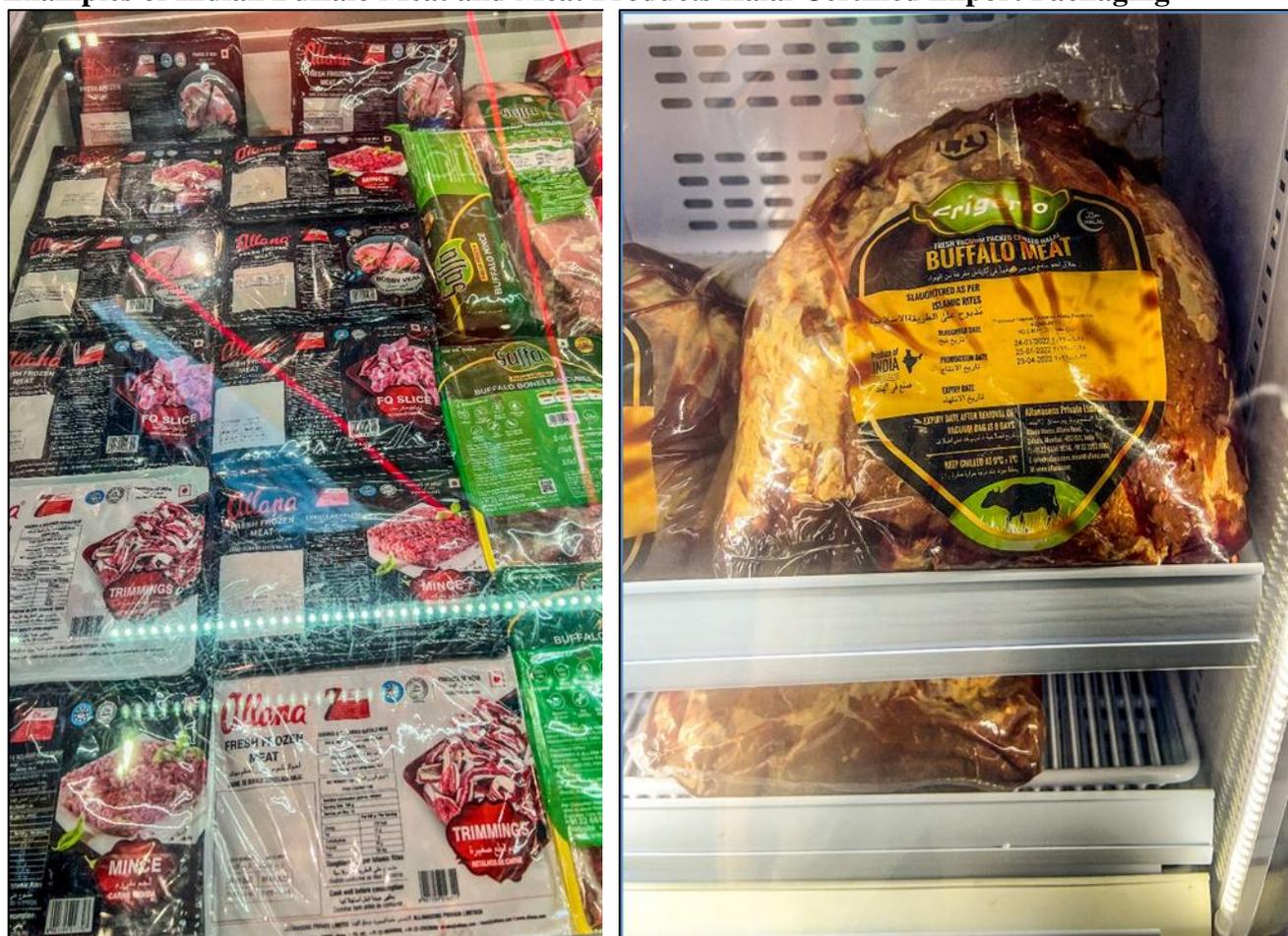
Source: Trade Data Monitor; FAS New Delhi office research.

**Figure 7: India, Carabeef Top Export Destinations, CY 2022**

	Countries	Total Exports Value	Total Exports Percent
	<b>Total World</b>	<b>\$2,967,364,000</b>	<b>100.0</b>
1	Malaysia	\$490,038,000	16.5
2	Egypt	\$472,219,000	15.9
3	Vietnam	\$429,535,000	14.5
4	Hong Kong	\$338,670,000	11.4
5	Iran	\$216,746,000	7.3
6	Saudi Arabia	\$179,332,000	6.0

Source: Trade Data Monitor, FAS New Delhi office research.

**Examples of Indian Buffalo Meat and Meat Products Halal Certified Export Packaging**



Source: FAS New Delhi.

**Indian Carabeef Attempts to Tap High-Income Markets:** The Ministry of Commerce and Industry (MOCI) regulates India’s livestock and livestock product exports. Through Agricultural and Processed Food Products Export Development Authority (APEDA), it champions the export of food and agricultural products. Domestically the Food Safety and Standards Authority of India (FSSAI)

regulates slaughter and meat processing by means of the Food Safety and Standards Rules and Regulation (2011).

India at present lacks market access to most of the world's high-income markets, including the United States. These countries do not allow imports of fresh/chilled/frozen carabeef (harmonized tariff system code – HS 0201.10; 0201.20; 0201.30; 0202.10; 0202.20; 0202.30; 0210.20; 1602.50) from countries (including from India) classified by the WOAAH as FMD-endemic. As with the United States, many of these high-income countries do not recognize the WOAAH's declarations, rather they perform their own evaluations.

Currently, most of India's lower cost carabeef exports ship to low- and middle-income developing countries, which are less concerned with India's FMD status. In fact, India's top six export destinations for carabeef account for 72 percent of Indian carabeef exports (see, [GAIN-INDIA | IN2022-0005 | - India Halal Overview](#) and [GAIN-INDIA | IN2023-0010 | India Halal Market Update](#)). These countries, much like India, are also currently classified as by the WOAAH, and the United States, as being FMD-endemic.

The concern of FMD-free countries, such as the United States, which eradicated the disease in 1929, is premised on risk-based regulations. FMD is one of the highest risk viruses that is regulated. In the case of the United States, the world's second-largest consumer and exporter of red meat and meat products, an FMD outbreak could result in severe economic losses of upwards of \$200 billion.<sup>13</sup> An FMD outbreak would potentially slow agricultural growth and consumer confidence.

**Attachments:**

No Attachments.

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<sup>13</sup> See, USDA, "Foot-and-Mouth Disease Vaccination Policy in the United States, October 2020," located at [https://www.aphis.usda.gov/animal\\_health/emergency\\_management/downloads/fmd-vac-policy.pdf](https://www.aphis.usda.gov/animal_health/emergency_management/downloads/fmd-vac-policy.pdf).