

THE ROLE OF BEEF IMPORTS  
IN THE UNITED STATES

By

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Abstract: Livestock extension educators are frequently asked why the US imports beef when it already produces a large amount of high-quality beef. The typical answer given is that the US exports large amounts of high-quality beef and so must import lower-value cuts to meet the US ground beef demand. Is this the case? Thus far educators have no peer-reviewed study to cite for this claim. This study describes how US beef imports are used by analyzing import data from the USDA Food Safety Inspection Service, import and export data from Trade Data Monitor, and interviews with nine professionals in the beef industry. The results find that, yes, that answer is mostly correct. The average price paid for the US imports is lower than the price received for US exports, and most imports consists of boneless manufacturing trimmings used to make ground beef products for the food service industry. However, not all imports are used to produce ground beef and there is heterogeneity in how imports from different countries are used, so a more nuanced discussion of the role of US beef imports is provided.

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## CHAPTER I

### INTRODUCTION

The United States produces some of the highest quality beef in the world and lots of it. In fact, the US is the largest beef producing and consuming country in the world (USDA, 2022). Many cattle and beef producers then question why the United States imports beef from other countries.

When analyzing international beef trade, an important fact to recognize is that beef is not a homogeneous commodity. Beef carcasses are fabricated into hundreds of different products, and beef products are differentiated by other quality attributes. Beef is a versatile meat in that has a starring role in both gourmet meals like Beef Wellington as well as low-cost fast food such as hamburgers. The same beef animal may provide ingredients for a Michelin restaurant and a frozen food entrée. Just as beef is not homogenous neither are cattle. Some breeds are designed for leaner beef and some are bred to produce higher amounts of fat. This heterogeneity in consumption and production implies that, when investigating the role of beef imports, one must pay keen attention to the type raised abroad and the intended use of meat being imported.

The United States' reputation for producing high-quality beef is a result of the distinct US beef cattle production system. US producers want to be able to export beef to foreign markets, where they may be able to receive premiums. However, trade is not a one-way street. In order to be able to export, the US must also import. The types of beef that the US is exporting versus importing is likely not equivalent.

This research analyzes the specific types of beef that the US import and the countries that imports originate from using data from USDA Food Safety Inspection Service. Additionally, it will explore differences in the value of US beef exports and imports. These two data sources alone are insufficient to fully articulate the role of US beef imports, though, so interviews were conducted with beef industry professionals. The end-result is both a simple explanation, as well as a more nuanced story, for why the US imports beef.

## **1.1 Objectives**

### *General Objective*

This research aims to clarify the role of beef imports in the United States by providing a thorough description of the types of beef imported and how they are used.

### *Specific Objectives*

1. Examine the amount of beef imported into the United States by country of origin and category
2. Evaluate the average per unit price of US beef imports compared to exports
3. Determine the intended uses of US beef imports, including common final beef products and end users
4. Describe how and why the intended uses and value of imports differ by country of origin and beef type

## **1.2 Definitions**

Boneless manufacturing trimmings – small pieces of meat and fat remaining after steaks, roasts, and other cuts have been removed, often used to make ground beef

Cull cow – older female cattle that are no longer profitable to keep for reproductive or milking purposes and are thus sold for their meat

CWT – hundredweight, common unit for measuring weight of cattle or beef. Abbreviation for centum which is 100 in Latin.

Expected progeny differences (EPDs) – predicted average performance of an animal's future progeny

Finishing – the act of caring for cattle in their last months before slaughter to ensure a high-quality beef product

Forage – feed consisting of grasses, consisting of live grass, hay, or haylage

Marbling – white flecks of intramuscular fat in meat, strong indicator of palatability

Primal – an initial piece of meat separated from a carcass during fabrication

Subprimal – secondary or portion cut of meat from a primal

## CHAPTER II

### BACKGROUND

To understand the role of beef imports in the US beef market, it is necessary to first understand how the beef production system in the US differs from other countries, the numerous retail products that can be created from a beef carcass, and the economics and history of trade.

#### **2.1 Beef Cattle Production Systems**

Beef produced in the US primarily comes from grain-finished cattle, meaning the last stage of consumption consists of grain-based feed in addition to forage. A stylized description of cattle production is as follows. Most calves are born on pastureland, where the calves and their mother consume a diet comprised mostly—often wholly—of forage. Once the calves are about 6 to 9 months old and around 400 to 700 lbs, they exit the cow-calf stage and enter the stocker or backgrounding stage of production (Ferdousi et al., 2020), where they are weaned and placed in groups on forage (in the central plains, often young wheat). After reaching 800 pounds and around 12 months of age they enter the feedlot stage. Here they no longer consume live grass and are confined in pens, receiving a feed containing some forage but large amounts of grain. They will remain in the feedlot stage for approximately 150 to 240 days until they have reached market weight, at which point they will be sold to a processor to be slaughtered (Clark, 2019).

Though that description generally reflects the lives of US cattle, the details do differ depending on the type of cattle and location of production. Virtually all calves spend their first months on pasture, but some are born in fall to take advantage of higher prices at weaning. In some cases, calves bypass the stocker stage and go straight into the feedlot. Also, the exact age and weight delineating the transition from one stage to another varies. However, one consistent feature in the life of most US beef cattle is that they spend the last months of their life consuming a diet comprised largely of grains. While there is a niche for grass-fed beef, and those cattle receive little to no grain, unless a beef product is explicitly marketed as “grass-fed” it is a grain-finished product.

The feedlot system is a defining characteristic of beef production in the United States. Feedlots are the preferred method of “finishing” cattle in the US, as it allows cattle to gain weight faster and more efficiently than grass-finished cattle (Broocks et al., 2017), and more importantly, the resulting well-marbled, grain-fed beef imparts a taste preferred by most Americans. Marbling, or intramuscular fat, is a strong indicator of palatability: tenderness, juiciness, and flavor (Hammock, 2008). In the United States, carcass quality grades of young beef are determined primarily based on the amount of marbling in the ribeye. Intramuscular fat is the last fat to develop. Since grain-finished cattle grow more quickly than grass-fed, fed cattle carcasses achieve higher degrees of marbling, reach higher quality grades and thus receiving higher prices. Conversely, grass-fed beef is typically leaner with less marbling, and is associated with lower quality grades. The fat on grass-fed beef carcasses is more yellow in color, whereas grain-fed beef fat appears whiter. These fat composition differences can result in flavor differences, where grass-fed beef may have a ‘grassier’ flavor (Beck and Lalman, 2021). Some other countries primarily produce grass-finished beef. Reasons might be less access to affordable grains or a specialization in leaner beef. For instance, Australia is a major beef producer and grass-finishing is their default beef production method. There is a growing niche market in the US for grass-fed

beef (meaning no grain in the diet), and some producers are eliminating grain to obtain the price premiums this market affords, but the market is only a very small percentage of all beef consumed in the US.

Another strong indicator related to marbling is classification and breed. There are two main classifications of beef cattle: *Bos taurus* (non-humped) and *Bos indicus* (humped), also known as zebu cattle. *Bos taurus* cattle are known for their high-quality carcasses (Hammock, 2008). In the United States, Black Angus, a *Bos taurus* breed, is the most common beef cattle breed, which are known for carcasses with high degrees of marbling. The popular Certified Angus Beef branded beef program brings a premium to producers with cattle that qualify for the label. Cattle with the *Bos indicus* influence are more adapted to tropical climates, a useful trait in many areas of the world. Brahman is the most common *Bos indicus* breed in the United States, known for their humped necks and large ears. There are many other *Bos indicus* breeds around the world. *Bos indicus* beef is generally leaner and tougher. In addition to selecting cattle breeds that align with production goals, cattle producers can also select sires for economically important traits using expected progeny differences (EPDs). Producers favor bulls with higher marbling EPDs since their progenies' carcasses are more likely to achieve higher quality grades (Smith and Greiner, 2013).

To summarize, beef production in the United States places a premium on marbling and quality grade, which is achieved through genetic selection and the feedlot system. Since intramuscular fat is the last type of fat to develop, carcasses with more marbling typically have more external fat that must be trimmed off. Therefore, the US beef industry produces large quantities of high-quality beef and fat trimmings, a fact that will be important when explaining why the US imports lean beef.

## 2.2 Beef Products

In addition to beef being differentiated by production system and quality grade, beef carcasses can be fabricated in multiple ways to produce a plethora of different products. Beef carcasses can be processed into seven major primal categories, including brisket, chuck, rib, loin, plate, flank, and round, along with offal and other byproducts (Clark, 2019). The rib and loin primals, often called “middle meats”, are where the highest value cuts from a carcass originate. Common high value cuts from the loin include the tenderloin, T-bone, and New York strip steak. Common cuts from the rib include the ribeye steak and prime rib roast. Quality grade is important in these high value cuts, and therefore, quality grade is the primary driver for the price received for a beef carcass.

Consider the chuck primal cut that contains several individual muscles, which can be fabricated in a variety of way. Many cuts from the chuck are less tender and leaner than the middle meats because the muscles were more actively used and possess larger muscle fibers. Often, the chucks from high-quality beef carcasses are fabricated into roasts and steaks and remain as fresh whole muscle cuts, while leaner chucks are more likely to be ground. Similarly, the round can be fabricated into a variety of steaks and roasts or used for ground beef. Because of the leanness, beef from the round can be used to make products like beef jerky and tenderized cutlets for chicken fried steak.

A critically important sector within the beef industry is ground beef production. Ground beef accounts for an estimated 45% of total beef consumption in the United States (Peel, 2021). Ground beef is an inexpensive, convenient protein source that can be used to create a variety of products and in an array of meals. Most grocery store ground beef is made from fresh ground primal cuts, from the end meats like ground chuck or ground round (Norwood and Peel, 2020). Food service ground beef is typically made from trimmings, including imported lean trim,

domestic lean and fat trim, and lean finely textured beef (Peel, 2020). Total estimated trim use for the ground beef industry was 8.5 billion pounds in 2019: 43% from fed trim, 27% cow trim, 26% imports, and 4% bull trim (Peel, 2020). At the wholesale level, ground beef represents nearly 60% of total volume but only about 20% of total value (Speer et al., 2015). Although lower in value, the ground beef and hamburger market is a critically important component of the US beef industry.

### **2.3 The Benefits of Trade**

Trade between countries is generally thought to be advantageous for both countries, as long as the prices and quantities are determined by market forces. The idea that international trade benefits all trading partners has been held by almost all economists, from Adam Smith to David Ricardo to the economists forming the Washington Consensus.

The Ricardian theory of comparative advantage is the basis of most research studying international trade. Ricardian theory states that even when a country holds the absolute advantage in the production of two goods, meaning it can produce more of both goods, the country can still benefit from specializing production in one good and trading with another country to acquire the second good. Assume, for example, the United States has absolute advantage in both the production of high-quality fed beef and inexpensive lean beef, but the US has a higher opportunity cost in producing inexpensive lean beef compared to country two. (A country with a lower opportunity cost in the production of a good is said to possess a comparative advantage.) The US can still benefit by specializing in high quality fed beef production while country two should specialize in inexpensive lean beef production. Under the theory's assumptions, this would result in a net welfare gain for each country, and both would mutually benefit from free trade. While this is an overly simplified example and neglects the complexity of real international



trade, the underlying concepts of specialization and comparative advantage make a compelling argument for free trade.

Increasing economies of size also allows trade to benefit two countries, and as with comparative advantage, its benefits stem from specialization. If there are increasing economies of size, then an industry can reduce its per unit costs by expanding output. However, output expansions require a larger market, and a country that does not trade with others has a more limited market. Free trade with other countries thus allows each country to expand output in a specific good and achieve lower costs, resulting in a scenario where all countries produce goods and services cheaper than they can in the absence of trade. Adam Smith describes this relationship between economies of size, the size of the market, and wellbeing of nations in what is considered the first true book on economics, *Wealth of Nations* (Norwood et al., 2022).

Not every industry will possess increasing returns to scale. The fact that farm-level beef production relies on the fixed input of land suggests beef does not, but there are aspects of beef production where increasing returns to scale are a possibility. Increasing economies of scale can be seen within the beef processing sector, where increasing output can decrease the average cost of production. Much of the improvements in beef carcass quality stem from the adoption of better genetics, and with artificial insemination one superior bull can impregnate an enormous number of heifers and cows. A small improvement in a carcass EPD in sires can then lead to meat improvements in millions of carcasses, suggesting that in this sense the US can produce higher quality beef at a lower cost by achieving high levels of production, thus making investments in carcass EPDs profitable.

Deregulation and trade liberalization were two of the recommended policy reforms in the Washington Consensus, which describes policies that can potentially reduce macroeconomic turbulence and increase economic wellbeing (Irwin and Ward, 2021). This holds true for policies

that impact the global beef industry. Policies that allow firms to more freely enter and exit a market can stimulate more competition, promote efficiency, and economic growth. Similarly, policies that reduce trade barriers and promote international trade are likely to lead to increased efficiency and economic growth. Though economists may hold different views on how quickly trade should be liberalized, most all agree that is the direction in which trade should move.

## **2.4 International Trade in Beef**

For reasons described in the previous section, there has been a move to greater trade liberalization around the world in the last century. This section will review agreements that have been critical in the move towards trade liberalization, the history of US beef trade, and trade implications for the United States beef industry.

### **2.4A Overview of GATT and WTO**

After World War II, many multilateral organizations were created to provide forums to diplomatically discuss international issues to lessen the likelihood of future conflict, including the General Agreement on Tariffs and Trade (GATT). The GATT was established in 1947 to promote freer trade among member nations by reducing tariffs and trade barriers through multilateral negotiations. Guiding principles of the GATT were reciprocity, non-discrimination, transparency, national treatment, and compensation (Reed, 2016). Reciprocity means that to increase one country's market access and reduce trade barriers, the country must be willing to do the same for others. Countries were expected to give the same preferential treatment to all member countries, a practice known as the Most Favored Nations principle. Trade barriers should be transparent and not disguised. National treatment means that goods within a country should receive the same treatment, regardless of their country of origin. The last principle of compensation stated that countries harmed by changes in policies of other countries were entitled to compensation (Reed, 2016). Originally, the GATT did not have a means to resolve disputes,

which became an issue as membership increased in the 1980s and 1990s (Reed, 2016). The GATT evolved through several rounds of negotiations, with the final and most important one being the Uruguay Round Agreement that concluded in 1994 and led to the formation of the World Trade Organization (WTO).

The WTO supersedes the GATT and was officially established in 1995. It functions to implement current agreements, negotiate new agreements, settle disputes, and review trade policies. The WTO deals with not only trade in goods, but also trade in services and intellectual property. Guiding principles of the WTO maintained three important principles of the GATT: most favored nations, national treatment, and transparency. The WTO also aims to promote freer trade gradually through negotiation, promote fair competition, and encourage development and economic reform.

#### **2.4B History of US Beef Trade**

The United States has been a global leader in beef production and consumption since the beginning of the commercial beef industry in the early 20th century. The United States began importing significant amounts of beef from Australia in the 1950s. Since the beginning of major beef imports, US beef producers have been concerned that imports will increase supply and thus depress prices in the domestic cattle and beef markets (Dhoubhadel and Stockton, 2010). As a result of producer concern, Congress enacted the 1964 Meat Import Law (Public Law 88 – 482), which limited the meat imports to approximately 7 percent of domestic red meat production (Nelson et al, 1982). Consumers criticized the restriction of beef imports, arguing that it led to excessively high beef prices (Dhoubhadel and Stockton 2010, Nelson et al. 1982, Chambers et al. 1981). This led to an increase of quota levels in 1968 and 1977 (Nelson et al, 1982). Then, the former 1964 act was replaced by the Meat Import Act of 1979, which allowed imports to run counter-cyclical of domestic production. It increased imports to 10 percent of the base quantity

that was determined by an adjustment factor based on levels of production, growth factors, and average annual imports (Dhoubhadel and Stockton 2010, Nelson et al. 1982, Chambers et al. 1981). This was then replaced by a system of tariff rate quotas (TRQs) established as a result of the WTO's 1995 Uruguay Round Agreement, which is the way US beef imports are regulated today (USDA FAS, 2016).

#### **2.4C Current Beef Import Regulations**

Tariff rate quotas (TRQs) are the primary guide that determines the amount of beef the US imports from specific countries each year. TRQs allow a specified annual volume of imports into a country at a lower (or zero) duty rate and then assigns a higher duty rate for volumes above the specified quota level. This is aimed to transform complicated trade barriers like import bans, licenses, quotas, and other restrictive regulations into a simple, clear import tariff. There is justifiable concern that many technical barriers are a disguised means of protectionism (Reed, 2016). TRQs aim to increase transparency and make it easier to assess how quickly trade barriers are being lowered over time (Reed, 2016). The TRQ level is often set at some average import level of previous years. This ensures exporting countries do not lose their current market when tariffication occurs and allows them to export additional quantities above the quota level at a higher tariff rate if their price is still competitive (Reed, 2016). Tariff rate quotas have become increasingly common. They are often established as a transitional step to gradually work towards duty-free access (USDA FAS, 2016). TRQs played a crucial role in the 1995 Uruguay Round for many commodities and were important in the early years of the North American Free Trade Agreement (NAFTA) (Reed, 2016).

There were two types of tariff rate quotas established for beef imports: country specific TRQs and an "other countries" TRQ. Country specific quotas were created for beef imports from Australia, New Zealand, Argentina, Uruguay, and Japan. Other countries eligible to export beef to

the United States supply under the “other countries” quota. The countries with the largest two quota levels are Australia and New Zealand, respectively. Both countries have been major suppliers of US beef imports historically, which is why they had the highest quota levels established through the WTO negotiations. On top of Australia’s 378,214-ton WTO quota level, the 2005 US free trade agreement with Australia has been increasing Australia’s beef tariff rate quota level by 5,000 metric tons biannually, and unlimited duty-free access is set to begin in 2023. New Zealand has a 213,402-ton TRQ level. Argentina and Uruguay both have a 20,000-ton quota level in place. Japan had a small country-specific 200-ton quota level. However, they recently gave that up so they can supply under the other countries quota level that is over 64,000 tons. Japan exports high value Wagyu and Kobe beef, and this gives Japan the opportunity to export more without a 26.4% duty being imposed on top of their high value product. Countries that supplied under the “other countries” TRQ in 2020 were Brazil, Ireland, Netherlands, Japan, Namibia, and France. Brazilian beef imports were partially suspended from 2017 to 2020, and during that time, Brazil was only able to export prepared and processed beef products to the United States.

Some countries have free trade agreements (FTAs) with the US and are not subject to beef TRQs. Canada and Mexico are two of those countries. They have had unlimited, duty-free access since the North American Free Trade Agreement (NAFTA) was fully implemented in 2008 (USDA FAS, 2016), which was then replaced in 2020 by the United States Mexico Canada Agreement (USMCA). As of 2020, countries a part of the Dominican Republic – Central America FTA gained unlimited, duty-free access to the US market. Currently, CAFTA-DR countries eligible to ship beef to the US include Costa Rica, Honduras, and Nicaragua. These CAFTA-DR countries were previously supplying under the “other countries” TRQ, but since the FTA was fully implemented in 2020, their volumes are no longer contributing to the other countries level. This reduced pressure on the “other countries” TRQ and allows opportunity for other countries to

supply higher volumes toward that quota level. Additionally, the US has had an FTA with Chile since 2004, which allows Chilean beef unlimited, duty-free access to the US market.

Not all countries are eligible to export beef to the United States. Countries must first be approved by the US Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) based on animal disease status. This assesses the risk of introducing foreign animal diseases into the US because of trade. Then, USDA Food Safety Inspection Service (FSIS) assesses an importing country's food processing and regulatory system to ensure that its sanitary measures are equivalent to US standards (USDA FAS, 2016). This includes all elements of inspection, hazard analysis critical control points (HACCP) plans, and E. Coli testing protocols. US beef tariff rate quotas apply to fresh/chilled and frozen beef only, listed under HS heading 0201 and 0202. Prepared and processed beef products are not subject to TRQs.

#### **2.4D Trade Implications for US Beef Industry**

As previously established, the United States produces high-quality beef and is the top beef producing country in the world. Still, global trade continues to grow and liberalize, and the beef industry is no exception. Trade is not always beneficial for every sector within an economy, for example, the textile industry in the United States. However, most economists and policymakers believe that trade increases wealth overall. It allows for specialization, lowers prices, competition that incentivizes technological advancements, and expands product availability and choice. Trade poses both opportunities and threats for the US beef industry that will be explored further in this section.

The high-quality, grain-fed beef that the United States specializes in is typically viewed as a premium product around the world. US beef producers want to export and expand the US market share in foreign beef markets, where premiums will be received for their products. It is important to remember the principle of reciprocity – trade is not a one-way street. For the United

States to export beef, the US must also import. However, imported beef is not necessarily in direct competition with domestic product since, as previously established, beef is a heterogeneous commodity. In fact, Elam (2003) argued that importing lower value beef would be profitable for the US cattle producers because they have the comparative advantage in high-quality fed cattle, and this allows them to capture more value in the domestic and export markets. Additionally, the US exports offal beef products, which there is little demand for domestically.

Recall the US produces a large volume of well-marbled beef, which simultaneously results in producing a large volume of fat trimmings. Ground beef demand is high in the US and production requires a significant amount of lean beef trimmings. To produce 85 GB (85% lean, 15% fat), a six to one ratio of lean trim (90% lean) to fat trim (55% lean) is required (Peel, 2020). Studies have claimed that leaner, lower quality imports can be blended with domestic beef products to make ground beef resulting in a complementary relationship (Buhr and Kim, 1997). Even though there is demand for lean trimmings due to ground beef demand, Speer et al. (2015) argued that US beef producers should not shift to target ground beef production because of the low value.

Some US cattle producers view beef imports as competition, and within certain sectors of production, there is some validity to this viewpoint. Imported lean trim competes with cow and bull trim, other domestic lean beef trim, and lean finely textured beef, all inputs in ground beef production. Additionally, there are some imported high-quality beef products that compete with high-quality domestic beef, for example, well-marketed grass-fed steaks from Australia and high-value Wagyu beef from Japan. However, these products are bound for small niche markets and account for a small percentage of beef imports.

Most research has indicated that US beef imports do not have an adverse effect on domestic beef prices. One study estimated own-price and cross-price flexibilities among domestic

and imported beef products at the wholesale level and found there was not enough evidence to conclude that US beef imports influence domestic beef prices (Dhoubhadel and Stockton, 2010). Many studies indicate that restricting US beef imports would negatively impact US beef producers and consumers. Chambers et al. (1981) found that US beef import quotas resulted in a consumer welfare loss. Nelson et al. (1982) found that restricting imports would require an 8% larger cow herd and a 12% increase in corn required for feeding beef cattle. The increase in resource usage would result in higher average cost of production. Imports play an important role in optimizing the least-cost domestic cattle herd size in the United States (Nelson et al, 1982). Peel (2021) estimated that restricting beef imports would lead to a 45% decrease in ground beef production, or an increase in grinding whole muscle cuts that could otherwise be sold at higher prices in other markets, or an increase of 10 to 15% of yearlings raised as range beef but sell for the lower price of cull cows, overall resulting in lower value for the US cattle industry. If the US were to restrict lean beef imports, it would decrease the supply of ground beef, raising the price, thus driving consumers to other ground beef substitutes such as pork and chicken, lowering overall beef demand (Elam, 2003).

All of this suggests that there are many reasons why we may import beef, but a major reason is to combine leaner beef from overseas with fat trimmings of US domestic cattle to produce ground beef. Indeed, that is the major explanation given to US cattle producers on why we import (Peel, 2020). This claim is generally backed by data, but there is no source systematically articulating the types of beef the US imports along with explanations for how that beef is used. The purpose of this study is to make this articulation, and the data used to do so is discussed in the following chapter.



## CHAPTER III

### DATA AND METHODS

To understand the role of beef imports in the United States, it is important to examine the amount of beef imported and where imports originate, but also to analyze the types of beef imported to understand how they are used. Thus, the data used needs to specify exactly what type of beef products are being imported. Price data are also useful, as the per unit price of beef is an indicator of its quality, as it relates to the value of the cut type and quality grade. Imported beef prices can then be compared to export prices to evaluate the relative quality of US imports and exports.

This study will use two separate data sets on United States beef imports. One contains detailed annual US beef import product information from 2012 to 2020 acquired from the US Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS). These data were originally acquired through a Freedom of Information Act request but have subsequently been made publicly available. The year, country, product category, process category, product group, and net weight presented for inspection is reported for all imports. Referred to throughout as the “FSIS” data, its strength is that it contains considerable detail on the types of beef products being imported and the amounts of each type. Its weakness is that it does not contain information on the prices of those imports. The other data set was collected through the Trade Data Monitor (TDM) database and is referred to as the “TDM” data, containing trade flow data for US beef imports and

exports in terms of both quantity and value. Though the TDM data have less information on the specific type of beef being imported, it does contain information on prices.

The FSIS data identifies each import as belonging to one of fifty products, though most imports belong to only a few products, so all products were placed into one of five different categories of imported beef. The categories were first separated by the three highest reported product groups: “boneless manufacturing trimmings”, “primals and subprimals”, and “cuts”. The third category labeled “raw other” is a construct of this study, formed by aggregating all other product groups within the process categories of “raw – intact” and “raw – non-intact.” The final category of “cooked/processed” was comprised of all product groups that were heat treated, thermally processed, fully cooked, or shelf stable products. A table that details each FSIS product group that was categorized for this study, and the respective FSIS product category and process category, can be found in Appendix A.

The TDM data identifies each import type using the 12 harmonized system (HS) codes that comprise beef and beef product data, reported by the US Census Bureau. TDM is primarily beneficial for differentiating between boneless vs bone-in beef, frozen vs fresh/chilled beef, and examining the value of exports and imports. The TDM data were also divided into five categories: 1) boneless fresh, 2) boneless frozen, 3) bone-in cuts fresh, 4) prepared/preserved, and 5) other. The “other” category comprises all other beef and beef products, including bone-in cuts frozen, carcasses and half carcasses, and various offal cuts. These other subheadings are grouped together because each represents a small proportion of US beef imports. A table that details the HS codes categorized from the TDM Data can be found in Appendix B.

In addition to the quantitative beef import data, qualitative data were also collected through interviews with nine beef industry professionals. The purpose of these interviews was to clarify how specific beef import types are utilized and in what form they are ultimately

consumed. Professionals who are familiar with the beef import space and companies that utilize imported beef were contacted and requested for an interview. Interviews were conducted with individuals who oversee the use of imported beef at beef packers, beef processors, and beef industry groups. The interviews were limited to nine because of the consistency of answers from all nine respondents and the limited number of such experts in a concentrated market. No identifying information of companies, organizations, or individuals will be disclosed for confidentiality purposes and to ensure no proprietary information is revealed.

Interviewees were first asked to describe their company role and how it relates to US beef imports. Graphical results from the FSIS and TDM data similar to Figure 1 - 4 were shown to interviewees. For packers and processors, we asked them to identify categories of imports they used and where they came from. Additionally, we asked what types of products could be created from the different categories of imported beef. For example, they were shown a graph showing the amount of boneless manufacturing trimmings imported and were then asked about the different ways the trimmings are utilized. We asked individuals working for trade organizations questions relating to why the uses and value of beef imports differs by country and category. Interviews were conducted over Zoom and lasted 30-45 minutes. At the permission of interviewees, each interview was recorded, transcribed, and bulleted notes were taken. After the conclusion of all interviews, notes from all were compiled together, organized into categories, and are reported in written paragraph form in the interview subsection of the results section.

## CHAPTER IV

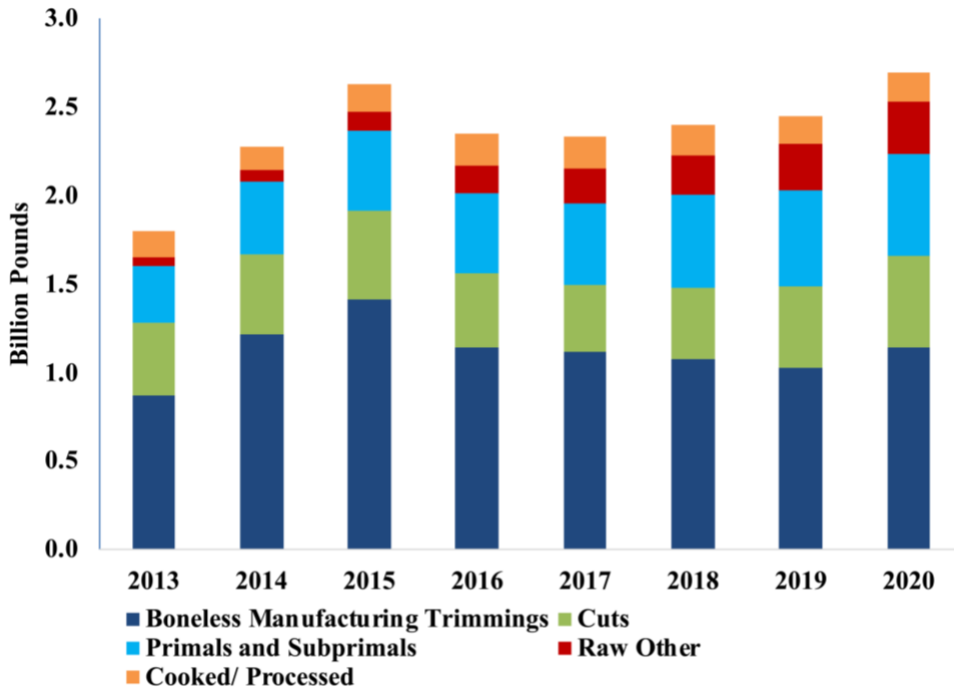
### RESULTS

This section first provides visual descriptions of the meat import data provided by the Food Safety and Inspection Service (FSIS). Visual descriptions of trade flow data from Trade Data Monitor (TDM) are then provided, focusing specifically on the relative price of US imports and exports, using price as a proxy for quality. The results of the interviews with nine beef industry professionals are then articulated to better determine what the FSIS and TDM data tell us about the role of beef imports in US beef consumption.

#### **4.1 FSIS Data Results**

The FSIS data details the specific cut types of beef imported and their origin. First, total imports of each import type are provided for each year. Then, total imports from each source country are illustrated for each year and are followed by the total imports across all years of each import type provided by country.

**Figure 1. Types of US Beef Imports**



See Figure 1 above regarding the amount of each beef type the US imported in recent years.

While the total amount of imports varies across years, the proportion comprised of the five different types are relatively stable. On average, boneless manufactured trimmings accounted for 47.3% of total imports, followed by primals and subprimals which accounted for 19.8%, cuts at 19.0%, and then raw other and cooked/processed each accounted for 6.9% of the total amount of imports. Cuts can be defined as primals and subprimals that have been further fabricated into table cuts, like steaks and roasts. The category of raw other aggregates all other raw beef, such as carcasses, raw formed hamburger, and other raw products. The ultimate use of each different beef import type will be discussed later in the interview results, but the question of why we import beef can be partially answered by learning the intended use of the trimmings.

**Figure 2. Suppliers of US Beef Imports**

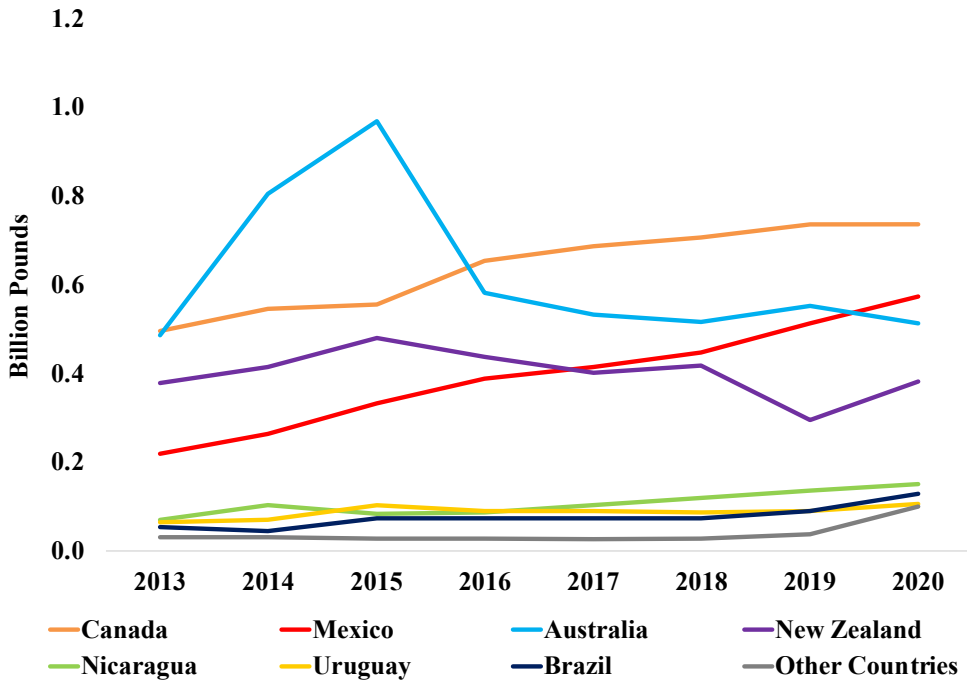


Figure 2 above shows imports by country of origin. Over 80% of all US beef imports come from four countries: Canada, Mexico, Australia, and New Zealand. Since 2013, total imports from Canada and Mexico have steadily increased. The upward trend in imports reflects greater trade liberalization and are accompanied by a similar rise in US exports, as will be discussed shortly. Imports from Australia have an unusual pattern compared to the other countries. The peak in imports from Australia in 2015 was a result of major herd liquidation due to a significant multi-year drought. Australia is still rebuilding their herd, and the reduced availability of cattle ready for slaughter has been the primary reason for Australia's decline in beef production and exports in recent years. China's growing demand for beef has led to countries like Australia and New Zealand to export more to China. China is now the top beef importing country in the world, surpassing the US, which had historically been the leading global beef import market.

**Figure 3. US Beef Imports from 2012-2020, by Country and Type**

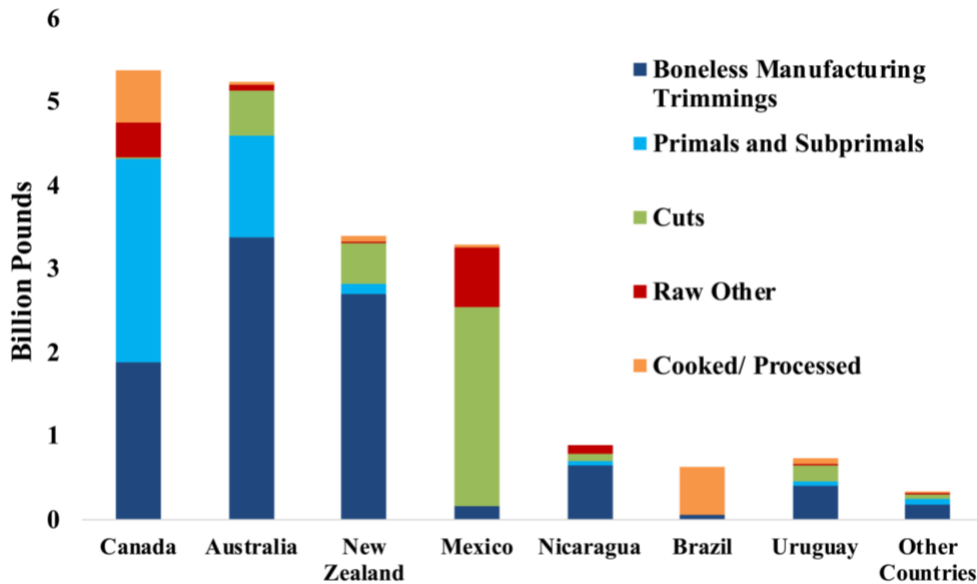


Figure 3 sums all imports of each beef type for each country for the years 2012-2020 and shows distinct differences in what each country exports to the US. Both Australia and New Zealand dominate imports in terms of boneless manufacturing trimmings, so an important component of the interviews is to understand why they export so much of this one particular product. Mexico and Canada both border the US yet export very different products, with Canada exporting large amounts of primals and subprimals, and Mexico exporting mostly cuts. As previously mentioned, Brazil was suspended from exporting raw beef to the US from 2017 to 2020 because of animal health and food safety concerns, which is why most imports from Brazil were cooked/processed beef products. Lower import volumes originated from Nicaragua, Uruguay and other countries, but the majority of those imports are also classified as boneless manufacturing trimmings.

#### **4.2 TDM Data Results**

The Trade Data Monitor data are less useful for identifying what types of beef are being imported but have the advantage of containing both quantity and value, allowing an indirect calculation of price. To the extent that price is a proxy for quality, the price of beef imports across countries can

be used to determine the quality of beef each country exports to the US. Moreover, by comparing the US import prices to US export prices one can evaluate how the quality of what the US ships abroad and what we import compares.

**Figure 4. TDM US Beef Imports from 2012-2020, by Country and Type**

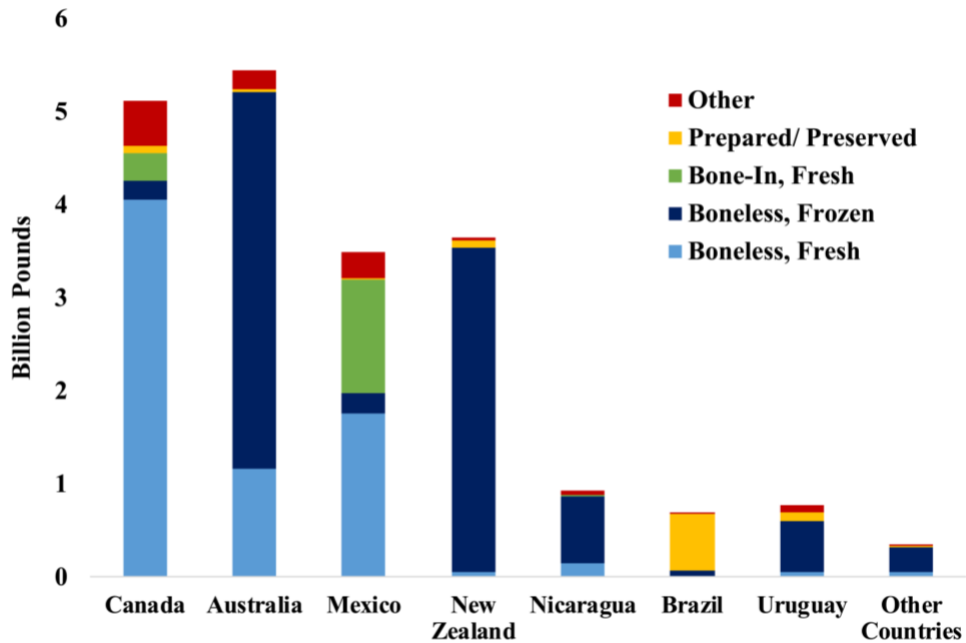
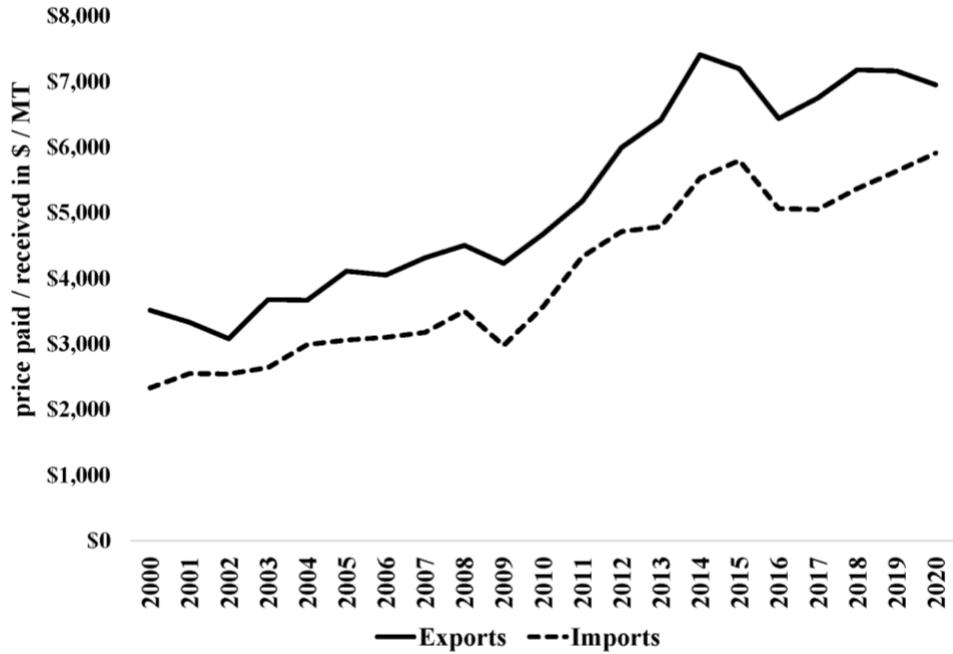


Figure 4 highlights that across the board, most imported beef product is boneless. Logically, it seems more efficient and cost-effective to ship boneless product because it weighs less than bone-in product. However, Mexico is a notable exception. This indicates that many of the cuts shipped from Mexico are bone-in. There is a small amount of fresh, bone-in beef imported from Canada as well. Figure 4 also illustrates that most imported beef from Canada and Mexico is fresh/chilled product. There are advantages to using fresh product, though it does have a shorter shelf life than frozen product. However, it is the most logistically feasible to ship fresh product and bone-in product from the two countries that are closest and border the US. In contrast, most beef from Australia and New Zealand is boneless, frozen product. Considering the shipping times are longer from both countries, it is more reasonable to ship product with a longer shelf life. This also



indicates that most of the boneless manufacturing trimmings from Australia and New Zealand are frozen.

**Figure 5. Average Value of US Beef Imports Relative to Exports**



Trade flow data shows that since 2000 US beef exports have consistently sold for a higher per unit average price than US beef imports, signifying the US imports lower valued beef cuts than it exports.

**Table 1. Value of US Beef Imports by Originating Country in 2020**

Country	Volume (metric tons)	% Total Volume	Value (\$ USD)	% Total Value	Average Price (\$/MT)
Canada	282,492	26.35%	\$ 1.665 B	26.28%	\$ 5,896
Mexico	238,854	22.28%	\$ 1.386 B	21.88%	\$ 5,804
Australia	218,798	20.41%	\$ 1.485 B	23.44%	\$ 6,789
New Zealand	166,788	15.55%	\$ 886.1 M	13.98%	\$ 5,313
Japan	529	0.05%	\$ 40.9 M	0.65%	\$ 77,325
Total Imports	1,072,252	100.00%	\$ 6.338 B	100.00%	\$ 5,910

Source: Trade Data Monitor

**Table 2. Value of US Beef Exports by Destination Country in 2020**

Country	Volume (metric tons)	% Total Volume	Value (\$ USD)	% Total Value	Average Price (\$/MT)
Japan	259,126	27.52%	\$ 1.573 B	24.04%	\$ 6,071
South Korea	234,846	24.94%	\$ 1.654 B	25.28%	\$ 7,045
Mexico	102,126	10.85%	\$ 623.8 M	9.53%	\$ 6,108
Canada	75,041	7.97%	\$ 545.1 M	8.33%	\$ 7,264
Hong Kong	70,034	7.44%	\$ 573.7 M	8.77%	\$ 8,192
Total Exports	941,502	100.00%	\$ 6.544 B	100.00%	\$ 6,951

Source: Trade Data Monitor

Note: Include fresh/chilled and frozen beef only, listed under HS headings 0201 and 0202, and this exclude any processed and prepared beef products.

Tables 1 and 2 show the volume, value, and average value of US beef import and exports, by country in 2020. The tables highlight the fact that the US imported more beef than it exported on a volume basis. However, on value basis, the US was a net beef exporter. The average price of

US exports was more than \$1000/MT higher than the average price of imports. Looking at the United States' major trading partners in North America, it can be clearly seen that the US imports considerably more beef from both Canada and Mexico than the US exports to either country. However, when you look at the average price of US exports to Canada and Mexico, it is higher than the average price of imports from those countries. Although the US is exporting less to Canada and Mexico, this indicates that the product that the US is exporting is higher valued beef. However, this is not the case for every country; one notable exception is Japan as seen in Table 1. Beef imports from Japan are very high quality, as reflected by the high average price. Yet, Japanese beef imports still account for less than 1% of all US beef imports, on both a volume and value basis.

#### **4.3 Interview Results and Discussion**

The data from the FSIS and TDM shown in the previous section shed light on the types of beef being imported from various countries and their value relative to US exports. However, they ask as many questions as they answer. For example, they clearly demonstrate that the US imports large amounts of boneless manufacturing trimmings from Australia and New Zealand, but the data do not indicate what those trimmings are used for. The data show few trimmings are imported from Mexico, but many cuts of beef are. What are these "cuts", and how are they sold to consumers?

To clarify what the data imply about why we import, it was necessary to interview industry professionals to understand how imports are used downstream in the supply chain. The graphical results shown previously in this section were shown in each of the nine interviews, and the respondent was asked to explain what each import type is ultimately used for in terms of the final beef product consumed.

#### *4.3A On Imported Beef Categories*

Interview respondents were unanimous that the main use of boneless meat trimmings is to make ground beef for US consumption. Imported trimmings tend to be lean and are then combined with fatty trimmings from US cattle for an ideal ground beef product. Most imported trimmings have a chemical lean composition of 85% - 90%, which means the other 15% is fat. They tend to be combined with US domestic trimmings which are 50% lean to produce ground beef. This ground beef is not sold directly to consumers but is used to create wide variety of ground beef products, such as hamburgers for fast food establishments, hot dogs, sausage, pizza toppings, or other processed beef products.

Using frozen imported trim in the grinding process can be beneficial from a food safety perspective because it helps keep product temperature low during grinding which limits microbial growth. However, there are limits on the amount of frozen trim that can be utilized. Further processors can temper the product (warm frozen meat to a temperature slightly below the freezing point) using industrial microwave ovens. Grinders that do not temper the product can only use approximately 30% frozen trim, whereas those with microwaves can use close to 50 – 60%. There is an upper limit for frozen trim that can included because patties do not form well if too much frozen product is used. Additionally, processors are subject to customer specifications that may detail frozen inclusion, chemical lean, and origin of inputs.

Imported primals and subprimals can be used in manufacturing or remain as muscle cuts to be fabricated into steaks and roasts. Those table cuts primarily enter directly into the HRI (Hotel, Restaurant, or Institutional) or food service supply chain. Flanks and skirts may be used for fajita meat at Mexican restaurants, and loins, ribeye rolls, and top butts may be cut into steaks. Imported product is often marketed at a lower value to domestic beef. (This was one of the few times an interviewee remarked on the lower prices of imported beef.) Primals used in

manufacturing could be used to create products like deli meat roast beef, and imported rounds are often used in beef jerky production. Lean primals can be used as a substitute for trimmings in ground beef production. Depending on current prices and supply, some imported primals may be used in grinding. Imports classified as cuts, including the high volume of cuts from Mexico, typically need little to no further processing before reaching the consumer.

#### *4.3B On the Source of Beef Imports*

The cattle and beef industry in Canada, Mexico, and the US could be considered one integrated market, given their proximity and the unrestricted duty-free trade. Canada and Mexico are both top five trading partners for US beef imports and exports. Some trade can be attributed to transportation efficiency costs, where it may be cheaper to ship beef from Canada to locations in the northern US than from domestic US beef plants that are further away. Canada produces high value beef cuts, as their beef industry uses similar breeds and production systems as the US. Product from Canada is treated similar to US beef. Imports from Mexico have grown significantly in recent years. Many of the cuts from Mexico are marketed with Mexican brands and sold direct to consumer in border states like Texas and California.

Imports from Australia and New Zealand bear many similarities. Both countries have historically been major suppliers of US beef imports and have large quota levels under the US beef TRQ system. Because of each country's food safety regulations and longstanding relationships with importers, there is public trust in their product. Most imports from Australia and New Zealand are frozen, boneless manufacturing trimmings. Both countries specialize in grass-finishing production systems. New Zealand has a large dairy industry that results in many cull cows for trim. Both countries export a large percentage of total production and have developed technologies suited towards freezing and exporting beef. Australia has begun to

develop specialty markets for premium grass-fed Aussie beef targeting wealthy consumers, especially along the east and west coasts of the US.

Culled cattle are an important source of lean beef used in manufacturing. This includes dairy beef, cows, and bulls. There is high correlation between 90% chemical lean and cull cow prices. When there are insufficient supplies of US culled cattle, imported trim can be used to supplement domestic lean trim supply. When imported lean trimmings are mixed with domestic fat trimmings (a byproduct with little value on its own), this raises the value of domestic fat trim, resulting in a complementary relationship. Imports from Australia and New Zealand are thus more of a competitor for culled cattle than feedlot cattle.

Fresh imported beef is typically not sold at the retail level because it is difficult to market without a USDA quality grade. Exceptions would include some of the cuts from Mexico or products specifically labeled to target small niche markets, such as Australian grass-fed steaks or Japanese Wagyu beef. These high-value imported cuts compete with high-value domestic beef products, but such products are a relatively small percentage of US beef imports, and imports account for a small percentage (about 11%) of total US beef consumption.

#### *4.3C On the Details of Importing Beef*

Interviews also helped to describe and understand the beef import supply chain, a complex system due to the numerous parties involved and compliance requirements. Beef importers that work for companies within the United States typically have established relationships with beef processors and production plants abroad. Plants will provide an offer or forecast of upcoming production schedule. Once an offer is received, a price will be negotiated that takes into account the transportation cost, insurance, and freight levels. After the terms are negotiated and the product is ready, it will usually be put in a 20- or 40-foot container and put on a container ship. The boat will arrive in a designated port in the US. Some of the main ports of entry are

Philadelphia, Los Angeles, and Houston. While in transport, the plant abroad will send documentation to the US importer, including the invoice and bill of lading, and the invoice for the product will be paid.

The product must then be cleared by US Customs for the container to be released from the boat. Importers typically have relationships with importing warehouses on the coasts that have USDA inspectors on site. A truck or trailer will be dispatched to get the container from the port and bring it to the warehouse. Once the container arrives, the seal is broken, and the quality of the product will be surveyed. Boxes will be pulled out of the containers and staged in the warehouse. A USDA inspector will come around to ensure shipping marks, case count, and products align with the documentation. Then each box will receive an approval stamp and enter the warehouse as “inspected.” From there, the importing company decides what to do with the product based on their sales terms. It can be picked up by a truck to be taken to a further processing facility or delivered to a customer. It can be released to a customer to be picked up from the warehouse, or the product can be directly transferred into a customer’s account at the warehouse facility.

Considering that beef is a perishable product that requires refrigeration or freezer space, import managers must carefully monitor storage availability, inventory levels, and demand forecasts. Importers must consider shelf-life limitations of fresh and frozen beef, and the wet aging that occurs during transport of fresh beef. Compared to frozen, fresh beef is more difficult to handle from a large-scale foodservice supply chain perspective. Additionally, importers must consider the seasonality of cattle and beef markets when forecasting demand for different beef products. Typically, import decisions depend highly on price and customer specifications. Uniformity of product is extremely important to food service customers, especially to global fast-food chains. They want customers to have the same eating experience each time, regardless of location. Utilizing raw materials from different sources can potentially impact the final product.

Differences in characteristics such as chemical lean, age of animal, and fat type can impact the overall flavor profile.

There are numerous factors that impact global beef trade and thus US imports. The global political landscape is constantly evolving, which directly impacts international trade. It is a complex system that balances supply and demand for each country that is involved in international trade in beef. Countries that export beef to the US also have other export markets. For instance, China's growing demand for beef imports in recent years may have caused exporting countries to shift some focus from the US market to the Chinese market. There are other market dynamics to note, such as the slow supply response in the beef industry, considering cattle are typically born 18 – 24 months before they are harvested. Additionally, it is important to keep in mind evolving consumer preferences, such as convenience and increasing health consciousness, along with concerns related to environmental impact, sustainability, traceability, and animal welfare. These topics facing animal agricultural industries globally may lead to changes in the long term for beef industry and US beef imports.



## CHAPTER V

### CONCLUSION

The intent of this research was to better understand the types of beef the United States imports and the purpose of US beef imports. This study analyzed import product data from USDA Food Safety Inspection Service to determine the types of beef imported and their country of origin. One limitation of this study is that there is no similarly detailed data, comparable to the FSIS import data, available for US beef exports. This research evaluated the value of US beef imports relative to exports using data collected through Trade Data Monitor. The quantitative data alone was insufficient to achieve the study's objective. Most beef imports could be classified as wholesale or intermediate products and may be further processed before reaching consumers, and little information was available about how these beef imports are used. To combat this information gap, nine beef industry professionals were interviewed, each of whom were knowledgeable on the US beef import space. Interviews provided valuable insight to what happens with beef imports downstream the supply chain and what types of final beef product the imports are used to create. These qualitative data provided many insights and developed a more nuanced discussion and enhanced understanding of the role of beef imports in the US.

The findings determined that most US beef imports are used to manufacture ground beef products. The products are commonly utilized within the fast-food service supply chain. Imports that come in intact muscle form, including primals and subprimals, are often used by institutions.

The United States cattle and beef industry specializes in producing high quality beef, not necessarily lean beef. Lean imported boneless manufacturing trimmings are mixed with domestic fat trim, which helps meet US demand for ground beef. Reciprocity is an important principle of trade, and beef imports allow the US to export beef. On average, US beef exports sell for a higher per unit price than imported beef. Most beef imports in the US are not designed to be in direct competition with domestic beef, but instead imports provide an alternative, and often less expensive, option for specific wholesale customers.

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## APPENDICES

### APPENDIX A: FSIS DATA CATEGORIES

<b>Category</b>	<b>FSIS Product Group</b>	<b>FSIS Process Category</b>	<b>FSIS Product Category</b>	<b>FSIS Secondary Product Category</b>
Boneless Manufacturing Trimmings	Boneless Manufacturing Trimmings	Raw - Intact	Raw intact beef	
Cuts	Cuts	Raw - Intact	Raw intact beef	
Primals and Subprimals	Primals and Subprimals	Raw - Intact	Raw intact beef	
Raw Other	Carcass (including carcass halves or quarters)	Raw - Intact	Raw intact beef	
Raw Other	Cheek Meat	Raw - Intact	Raw intact beef	
Raw Other	Edible Offal	Raw - Intact	Raw intact beef	
Raw Other	Head Meat	Raw - Intact	Raw intact beef	
Raw Other	Heart Meat	Raw - Intact	Raw intact beef	
Raw Other	Other Intact	Raw - Intact	Raw intact beef	
Raw Other	Weasand Meat	Raw - Intact	Raw intact beef	
Raw Other	Advanced Meat Recovery Product (AMR)	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	

Raw Other	Beef Patty Product	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Bench Trim from non-intact	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Finely Textured Beef	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Formed Steaks	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Ground Beef	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Hamburger	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Low Temperature Rendered Product	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Non-Intact Cuts	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Other Non-Intact	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	

Raw Other	Other Non-Intact Products	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Sausage	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Raw Other	Trimblings from Non-Intact	Raw - Non Intact	Raw ground, comminuted, or otherwise non-intact beef	
Cooked/ Processed	Diced/Shredded	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Hot Dog Products	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Meat + Nonmeat Component	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Nuggets	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	
Cooked/ Processed	Other Fully cooked not sliced product	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Other Fully cooked sliced product	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Parts	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Patties	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	

Cooked/ Processed	Salad/Spread/Pate	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Sausage Products	Fully Cooked - Not Shelf Stable	RTE fully-cooked meat	RTE meat fully-cooked without subsequent exposure to the environment
Cooked/ Processed	Bacon	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Meals/Dinners/Entrees	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Other	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Pies/Pot Pies	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Rendered Fats, Oils	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sandwiches/Filled Rolls/Wraps	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sauces	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sausage Products	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Smoked Parts	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Soups	Heat Treated - Not Fully Cooked - Not Shelf Stable	NRTE otherwise processed meat	



Cooked/ Processed	Bacon	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Jerky	Heat Treated - Shelf Stable	RTE dried meat	
Cooked/ Processed	Meals/Dinners/Entrees	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Not-sliced	Heat Treated - Shelf Stable	RTE salt-cured meat	
Cooked/ Processed	Other	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Other - Not sliced	Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	RTE dried meat
Cooked/ Processed	Other - Sliced	Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	RTE dried meat
Cooked/ Processed	Pies/Pot Pies	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Rendered Fats, Oils	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sandwiches/Filled Rolls/Wraps	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sauces	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sausage/Salami - Not sliced	Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	
Cooked/ Processed	Sliced	Heat Treated - Shelf Stable	RTE salt-cured meat	
Cooked/ Processed	Soups	Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Jerky	Not Heat Treated - Shelf Stable	RTE dried meat	
Cooked/ Processed	Not-sliced	Not Heat Treated - Shelf Stable	RTE salt-cured meat	

Cooked/ Processed	Other	Not Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Other - Not sliced	Not Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	RTE dried meat
Cooked/ Processed	Other - Sliced	Not Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	RTE dried meat
Cooked/ Processed	Rendered Fats, Oils	Not Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Sausage/Salami - Not sliced	Not Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	
Cooked/ Processed	Sausage/Salami - Sliced	Not Heat Treated - Shelf Stable	RTE acidified / fermented meat (without cooking)	
Cooked/ Processed	Sliced	Not Heat Treated - Shelf Stable	RTE salt-cured meat	
Cooked/ Processed	Soups	Not Heat Treated - Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Not-sliced	Product with Secondary Inhibitors - Not Shelf Stable	RTE salt-cured meat	
Cooked/ Processed	Other	Product with Secondary Inhibitors - Not Shelf Stable	NRTE otherwise processed meat	
Cooked/ Processed	Corned (species)	Thermally Processed/Commerciall y Sterile	Thermally processed, commercially sterile	
Cooked/ Processed	Other	Thermally Processed/Commerciall y Sterile	Thermally processed, commercially sterile	
Cooked/ Processed	Soups	Thermally Processed/Commerciall y Sterile	Thermally processed, commercially sterile	

APPENDIX B: TDM DATA CATEGORIES

<b>Category</b>	<b>6 Digit HS Code</b>	<b>Description</b>
Boneless, Fresh	020130	Meat Of Bovine Animals, Boneless, Fresh Or Chilled
Boneless, Frozen	020230	Meat Of Bovine Animals, Boneless, Frozen
Bone-In Cuts, Fresh	020120	Meat Of Bovine Animals, Cuts With Bone In (Other Than Half Or Whole Carcasses), Fresh Or Chilled
Prepared/ Preserved	160250	Meat Or Meat Offal Of Bovine Animals, Prepared Or Preserved, Nesoi
Other	020621	Tongues Of Bovine Animals, Edible, Frozen
Other	020629	Offal Of Bovine Animals, Edible, Nesoi, Frozen
Other	020610	Offal Of Bovine Animals, Edible, Fresh Or Chilled
Other	021020	Meat Of Bovine Animals, Salted, In Brine, Dried Or Smoked
Other	020220	Meat Of Bovine Animals, Cuts With Bone In (Other Than Half Or Whole Carcasses), Frozen
Other	020622	Livers Of Bovine Animals, Edible, Frozen
Other	020210	Carcasses And Half-Carcasses Of Bovine Animals, Frozen
Other	020110	Carcasses And Half-Carcasses Of Bovine Animals, Fresh Or Chilled

VITA

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