Beef, Pork, or Lamb? Comparative Study Between 3 Kinds of Red Meat Consumption in the USA toward the Number of COVID Cases

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ABSTRACT
Meat is the ingredient that is favored by everyone in the world. Too much of consuming red meat can cause problems to the body because of its fatty substance. COVID-19 can make cholesterol problem worsening. This study has a purpose to observe if there is a correlation between meat production in the USA with the rise of the COVID-19 case. This study uses a quantitative method with secondary data as the only source of data. The sample is divided into three; import number of beef, lamb, and pork in the USA, total number of COVID-19 cases in the USA, and popularity points of information search of those 3 types of red meat. The result shows that the number of beef imports also significantly increases the total number of COVID-19 cases in the USA. Beef has the highest fatty substance but cheaper than other types of meat makes beef the most demanded meat by Americans. Popularity points of information related to meat has no relation with the total number of COVID-19 case. Popularity points is affected by important event, rather than consumption.

INTRODUCTION

Meat is the ingredient that is favored by everyone in the world. Meat can be processed into various delicious dishes according to the structure of the meat and where the meat comes from. There are various kinds of meat according to the source of the animals' carcass (Escriba-Perez et al., 2017). Meat is divided into two kinds, meat from domesticated animals, such as cattle and poultry on-farm, and the meat from wild animals known as wild game. Each of them have various taste, nutrition content, smell, and flavor. Meat from wild game such as from boar, wild hare, wild deer, and wild duck tend to have a strong smell and flavor. Moreover wild game tends to have less fat because their activity are far plenty than domesticated animal (Hall et al., 2020). Domesticated animals are different than wild games and usually have a mellow taste of meat with more tender structure, because of the limited activity that they can do. Domesticated animals are targetted as the source of the country's nutrition, so that they tend to be raised fast to make it ready for slaughterhouse (Lukanov and Pavlova, 2020). There are some of the popular meat from cattle such as beef from cow and buffalo, mutton from sheep, chevon from goat, pork, and ham from pig. They are known as red meat, because of their color and structure which are marbling with red color. Red meat is the source of the main protein for the human body and is needed for children and young ages to grow well (Mazhangara et al., 2019).

United States of America is the country with the big population, reaches rank 3 of the biggest population in the world, below China and India. American people also love to eat red meat as their main food in daily life, especially in fried (An et al., 2019). Beef, pork, and turkey are considered as the meat at a low price, so they are consumed in the common life of American people. Chevon is the type of exclusive meat since it is expensive, but it is also popular in the USA because of its strong flavor (Saturno et al., 2020). Moreover, chevon has less saturated fat than beef or pork. Too much-saturated fat can cause health problems in the human body, such as artery blockage, hypertension, and high blood pressure (Micha and Mozaffarian, 2010). Lamb is meat from young sheep which has a tender texture and less saturated fat. Lamb is the healthiest meat than the rest (Maughan and Martini, 2012).

The USA also has a high ranking of obesity. According to the data of WHO in 2019, the USA ranked 12 as the country with high obesity, around 36,2% of its population (ProCon.org, 2020). People with obesity are more vulnerable to get infected by COVID-19 than people who don't. beef has the highest fat than chevon or pork, even though beef has the lowest price in the USA (Peng et al., 2020). USA also ranking one for the highest number of COVID-19 cases along with the total death, surpassing any other country in the world. Many possibilities can lead to the rise of the COVID-19 case. One of them is people with chronic illness or pre-existed diseases, such as obesity, diabetes, high blood pressure, or inflammation (Shoenfeld, 2020). This study has a purpose to observe if there is a correlation between meat production in the USA with the rise of the COVID-19 case.

MATERIAL AND METHOD

The data are the statistic taken from several websites which provide data to the public. The sample are red meat production number from the USA, the trends of meat consumption from the internet, and the number of COVID-19 case (Sargiacomo et al., 2020). The duration of the sample is started from the 15 February 2020, where the data was firstly announced to the public to July 2020 (Wardhana, 2020).

The sample is divided into three based on the criteria. One of them is red meat consists of beef, lamb, and pork. The data of the red meat are taken from https://www.ers.usda.gov, the website of the United States of the Department of Agriculture. Another is trends of information search about red meat based on the keyword of the meat being discussed and searched by the

internet users in the USA. The data about trends will be taken from Google Trends as free information provider supported by Google.Inc. Last is the number of COVID-19 case which is taken from the Worldometer website as the information provider of Global COVID-19 data. The data of red meat, the data of information trends, and the number of COVID-19 cases will be presented in the table. (Lin and Hou, 2020).

The number of trends represented in Google trends is the number of popularity points of a search term. Numbers represent search interest for a particular topic against the highest point of search for information on the chart for a particular region and time. The value 100 is the maximum popularity value of an information search. A value of 50 means the term is half popular. A score of 0 means that there is not enough data for this term (Wu *et al.*, 2019).

RESULT AND DISCUSSION

Table 1 Total USA Red Meat Import in 2020

Date	Kinds of meat	Total of production (pounds)
Feb/20	Beef	230.556
	Pork	65.032
	Lamb	15.075
Mar/20	Beef	298.983
	Pork	70.926
	Lamb	26.014*
Apr/20	Beef	270.671
	Pork	58.015
	Lamb	19.958
May/20	Beef	268.654
	Pork	82.422**
	Lamb	15.888
June/20	Beef	308.653
	Pork	79.289
	Lamb	11.821
July/20	Beef	376.826***
	Pork	73.182
	Lamb	16.448

Source: https://www.ers.usda.gov

The table above shows that beef is the biggest imported meat in 2020 than the other two types of meat. Lamb is the least imported meat, as a result of its price. The import of beef keeps increasing every month, while pork import number is dynamic, especially for lamb. The import of beef was the biggest in July, pork in May, and lamb in March. May is the special season for Americans when the kids are having a long break in summer from school. As a result, the consumption of pork is significantly rises, because pork has less saturated fat than beef and safer for kids to be consumed to avoid obesity (Park and Lee, 2015). Another important event in May is the *Cinco de mayo* as the special day of Mexican which celebrates the culture, background, and heritage of Mexico in the USA. Pork is commonly used as popular dishes in this festival. *Cinco de Mayo* is more popular in the USA rather than in Mexico itself (Pérez, 2015).

Table 2 Total cases of COVID-19 in USA

Day/month/year	Total cases of COVID -19
22 Feb 2020	15
22 Mar 2020	3821
22 Apr 2020	661.527
22 May 2020	1.499.122
22 Jun 2020	2.188.068
22 July 2020	3.636.525

Source: https://www.worldometers.info/

The table above shows that the total cases always raise in several folds each month. The total cases was started from less than 20, then raises to more than 200 times in the next month. It can be included that the virus is contagious that it can be infecting millions of people in a few months. Based on table 1, the number of beef import raises every month, similar to the number of active case of COVID-19 in the USA. It can be concluded that the more beef imported, the more COVID-19 case raises. Beef is considered as the meat with the highest fat than any other read meta such as pork, chevon, mutton, and ham. As a result, too much-consuming beef can lead to high blood pressure as a result of the accumulation of excessive fat (Crouse *et al.*, 2016). Behind the delicious taste, beef has different nutrients than other types of meat. According to a Clinical Nutrition Specialist, beef is healthier for the body because of the lower fat and cholesterol content compared to lamb. Lamb meat is

naturally lean, and has much lower in saturated fat and cholesterol, has a naturally higher amount of HDL and a naturally low amount of LDL (Gilmore *et al.*, 2011).

One of the reason American consume beef because beef has rich in iron/zinc, which it is useful for increasing metabolism in the body, influencing the spirit of learning of children and also as a fortress for our bodies because iron can increase endurance (Gandemer *et al.*, 2020). Beef also rich in protein to help the development of the brain, especially in neurons in children. Besides, protein can also help your body to form new tissue in injured muscles. Beef also rich in selenium which is needed to form antioxidants and increase children's immunity. Besides, high in fat, beef also rich in other nutrition (Casperson *et al.*, 2020). Beef has the biggest saturated and monosaturated fat is lamb. Although lamb has come from young sheep, less than a year old, the texture itself is better than mutton, even they come from the same type of animal. As a result, people like to eat lamb more than beef. But beef and pork are lower in calories because

lamb has more monosaturated fat than beef which can lower the cholesterol level. Lamb is much expensive than beef in the same weight as a result of the limited stock. Less a year sheep have less body weight than adult sheep. As a result, the production is less too, compared to beef from adult cows (Lee *et al.*, 2012). Americans prefer to buy beef rather than lamb because of those premises.

Pork has the least fat than the other two red meat. Lard or fat from pork is ranked eighth in 100 foods with a nutritional score of 74. The higher the nutritional score of a food, the more likely it is that the food will meet daily nutritional needs (Emelyanova *et al.*, 2019). Lard can become a good source of vitamin B and minerals. Besides, lard contains less saturated and much healthier than lamb or beef fat. Other good nutrition included in lard is oleic acid, with 60 percent monounsaturated fat. Monounsaturated oleic acid is good for heart health, arteries, skin and helps regulate hormones (Carrapiso *et al.*, 2020).

Table 3 Number of popularity points of information search about types of meat in the USA

Date	Search terms of meat	Total of popularity points
15 Feb/20	Beef	74
	Pork	48
	Lamb	15
15 Mar/20	Beef	79
	Pork	55
	Lamb	13
15 Apr/20	Beef	86***
	Pork	72**
	Lamb	36*
15 May/20	Beef	83
	Pork	59
	Lamb	19
15 June/20	Beef	73
	Pork	54
	Lamb	16
15 July/20	Beef	67
	Pork	52
	Lamb	15

Source: Google Trends

Table 3 shows that beef also has the highest popularity points than the other two meat. Beef is cheaper than other meat in the USA because of the abundant stock of cows. Moreover, steak and fast food in America tend to use beef for an ingredient, more than pork or lamb. The famous barbecue which become part of American culinary culture is also used beef, not pork or lamb. The popularity points of the three types of red meat are the highest in April because April has many important events such as Easter event, the national cherry blossom festival, earth day, and Major League Baseball (Kaus, 2017). The number of popularity points does not correlate with the total number of imports, since the peak of trends was in April, while each of the meat have their peak in different month instead of April.

The more internet users search for information about a particular topic, the higher popularity points will be. as there are some of important event in April held in the USA, people need to search more about what dishes will be best to celebrate the event, especially dishes use meat as an ingredient. People enjoy ham as traditional food for

the Easter event, which is why pork popularity points is the highest in April (Merutiu, n.d.). Historically, lamb is used for dinner in easter event, as it is shown in table 3 that popularity points of lamb also highest in April. it can be said that the three types of red meat above have the biggest popularity points in April because of an important event in the USA (Tarr, 2016). But the total case number of COVID-19 in April was not the biggest one. Based on table 2, July is the biggest number of the USA in importing beef, while pork and lamb were not. The data between the number of import case of beef and the total number of COVID case in July are related, since both of them reached the highest. But the popular points of that three red meat have no relation at all to the total number of COVID-19. Popularity points are more affected by the important event, rather than the total number of consumption or import. It means that there is no correlation between the popular points of a type of meat with the total number of COVID-19 cases in the USA.

CONCLUSION

Based on the result above, it can be concluded that the number of beef imports also significantly increases the total number of COVID-19 cases in the USA. The reason is because beef has the highest fatty substance than other types of meat, except lamb. Beef import number keeps increasing every month and July 2020 is the highest of the number of import of beef, while other types of meat are dynamic. The information trends of meat also does not correlate with the total number of COVID. Instead, the popularity points are affected by the important event in the USA such as Easter, summer holiday, cherry blossom, etc.

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