

DATA ANALYSIS OF COVID-19 VERSES DIET

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Abstract - Data is a collection of numbers which indicates about a particular thing. Data tells us the facts. We make use of technique called Data Analysis. Data Analysis organizes interpret structures and presents the data into useful information that provides context for the data [15]. For example, if we are doing an analysis related to the profit in a business, with the help of past records like based on month, season, festivals, etc. a data is prepared and a detailed analysis is done, then we get a rough idea about what steps should be taken ahead to extract more profit.

We have collected the data of Covid Cases of all countries. It is of first week of February 2021. On the other side we have considered the data of diet of all countries of the same time. We have included the food stuffs like Animal Products, Animal fats, Cereals-Excluding Beer, Eggs, Fish, Seafood, Fruits-Excluding, Wine, Meat, Miscellaneous, Milk- Excluding Butter, Offal, Oil crops, Pulses, Spices, Starchy Roots, Stimulants, Treenuts, Vegetal Products, Vegetable Oils and Vegetables [6]. The unit of diet/food products is in percentage (%) of that particular product consumed with respect to all other food products.

Whole data of Covid cases verses Diets is arranged in systematic way and it is also easy to understand. After that we found out the top 15 countries having most number of total cases. Then for each country we have shown the diet distribution with help of Pie chart. On the basis of these Pie charts we have given an overview on it.

Key Words: Covid-19, Statistical Methods, Diet, Data Analysis

1. INTRODUCTION

Coronavirus or Covid-19, these are the two words which are continuously hearing since 2 years. This tiny bacterium has made this huge world stop. We are tired of wearing the mask, continuous sanitization and the constant fear in the mind about it but, it should be continued. We know that our entire world is affected in all sectors like economic, social etc. Though in this extreme condition we are finding different ways to stay safe and continuously fighting against this deadly virus. Till some permanent solution is not available for this we have to take precautions.

In this situation some important things should be kept in mind like fitness. For fitness the most important thing is diet and exercise. Most of us know about exercise but the diet is such a topic which is often paid less attention and people usually avoid this topic. We think that for a healthy life the diet required will be all types of salads, green leafy vegetables, raw food item etc. All oily, fatty things which generally everyone likes should be avoided. But this is not true, only fruits, vegetables are not sufficient. Every food element should be provided to our body but in right proportion.

So, looking at this situation and the important part of diet, we choose the topic of "DATA ANALYSIS OF COVID-19 VERSUS DIET" we are trying to get a proper and scientific approach towards this problem. In this analysis we have considered most of the elements like pulses, oils, eggs etc. It is correlated against the Covid cases of each country of a particular date that is first week of February. We have averaged out the cases of first week of February. The analysis consists of compiled data of cases and diet elements, correlation between them and some graphs.

2. LITERATURE REVIEWS

The Global Macroeconomic Impacts of COVID-19: We are suffering for hard times due to this worldwide pandemic called COVID-19. The following research paper explains about the effect of this pandemic on the world's economy. In this paper mainly countries having macro-economy are focused, because these countries are mostly having poor health care options and moderate to dense population. All this is explained with the help of total 7 scenarios and they are: Pandemics, infectious diseases, risk, macroeconomics, DSGE, CGE and G-Cubed [16]. These scenarios help us understand the condition of the different countries. It also suggests some solutions to get out of this as soon as possible. Firstly it gives a brief introduction about the current condition in the pandemic section. Then it explains about the previous infectious diseases which also had a significant effect on the world. About the risk this paper tells us different definitions of risk according to different individual. In the macro-economic section we get to know about the economic conditions of different countries and effect of pandemic on it in detailed. DSGE and CGE model is explained next (In a hybrid form). DSGE and CGE stand for Dynamic Stochastic General Equilibrium and Computable General

Equilibrium respectively [17]. In the G-Cubed i.e. (G20) model top 20 countries having highest GDP are listed. Thus we get a brief idea about the development of countries. At last the result and conclusion is given and in it the problems are explained and also the methods to overcome them.

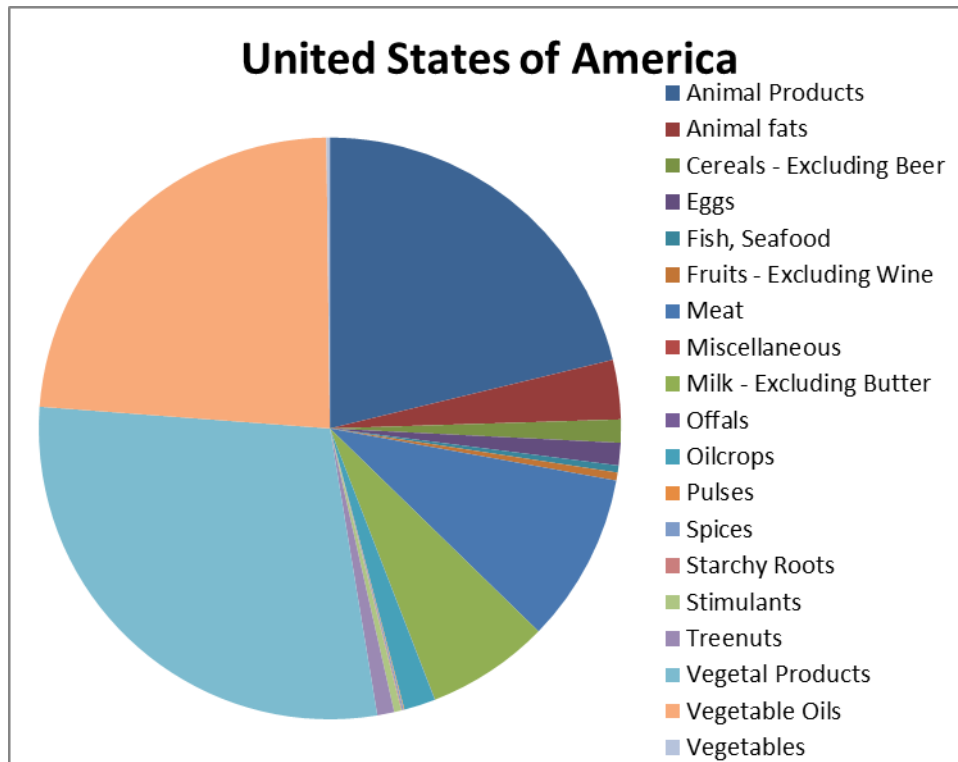
Leveraging Data Science to Combat COVID-19: This research paper focuses on the need to work Artificial Intelligence (AI) and Machine Learning (ML) so we can tackle the pandemic with the help of machines and make use of manpower at right place. In this paper we get a proper way to take help of technology present with us and find the solutions to the problems faster. The total research paper is divided into 7 parts as follows: INTRODUCTION, DATASETS AND RESOURCES, DATA SCIENCE APPLICATIONS FOR COVID-19, SURVEY OF ONGOING DATA SCIENCE RELATED COVID-19 RESEARCH, BIBLIOMETRIC ANALYSIS OF COVID-19 RESEARCH, CHALLENGES IN DATA SCIENCE RELATED COVID-19 RESEARCH and CONCLUSION. In the introduction part current situation of the pandemic is explained in detail. In the DATASETS AND RESOURCES section the paper consists of various methods to get the data of COVID cases also it consists of different website links which is helpful and also explains different types of datasets. In the next part i.e. DATA SCIENCE APPLICATIONS FOR COVID-19 applications of AI and ML like Risk Assessment and Patient Prioritization, simulation and modeling, mostly important i.e. Contact Tracing, etc. are explained in brief. Moving ahead we find SURVEY OF ONGOING DATA SCIENCE RELATED COVID-19 RESEARCH here different types of data analysis like image, textual, voice and sound, etc. are explained. In the next section of BIBLIOMETRIC ANALYSIS OF COVID-19 RESEARCH firstly how to collect this bibliometric data, Peer-Reviewed vs. Non-Peer-Reviewed Publications, Research Topics etc. CHALLENGES IN DATA SCIENCE RELATED COVID-19 RESEARCH section contains that that will be faced while working on this, for example difficulties like Data Limitations, Security, Privacy, Ethics, etc. are explained that how these difficulties occur and what solutions can be preferred. At last the conclusion of whole paper is given so we get vast idea about this topic and make use of technology to fight against this deadly virus and come out of the current worse situation as soon as possible.

Dietary Habits during COVID-19: This review is mainly focused on the effect of COVID-19 on people dietary habits in inhabitant of Denmark (Danes). Covid is growing day by day and spreading country to the country very fast. That's why government decided to take some tough decision on 13th of March 2020 and lockdown the countries. It causes that all public places were shut down hence peoples are stuck in home and then onwards some data were collected on the basis of dietary habits of people. According to this data peoples were taking proportion of large amount in their daily diet. ($\geq 28\%$) of respondents are gaining weight due to lack of exercise, overeating, etc. Med Diet (this project aims to raise the awareness of consumer about the significance of the Mediterranean Diet) is used to increase the standard of healthy nutrition and result could be seen as a very effective outcome. If this Med Diet sustained in the long term then it could help to prevent the onset of Covid and other related disease of Covid 19. In this condition they took a statistics for all variables were collected and taking their aggregate level as well as by demographics, body mass index and MEDAS score which is based on a 14 point scorecard system by using same cut offs {low : ≤ 5 , Medium: 6 to 8, High : ≥ 9 }. According to this score system people with low score in Med Diet (over 50% of people sample) were mostly affected by the lockdown. So the conclusion is more than 50% of peoples were participate in this aggregate are characterized by a low score in the Med Diet [5].

Impact of COVID-19 Pandemic on Healthy Meals: This paper focuses on the swapping in plan, selection and preparation of balanced diet compared to personal factors (money, time and stress) and also COVID-19 policies during this crisis. On 13th of March 2020 lockdown was imposed almost all over the world, all the public were shut down and people got stuck at home. In the months April and June 2020 the data regarding this paper were collected with the help of Cross-Sectional online surveys. This data was collected from 38 countries all over the world. And they analyzed swapping in knowledge, skills and behaviors in plan, selection and preparation of healthy foods to changes in personal factors and social distancing policies. This was done with the help of Hierarchical multiple linear regression analyses controlling which is special type of Hierarchical linear regression for a combination of Social and demographic factors. The eligibility criteria for this survey were grown person 18+ years old living in any of the country amongst 38 participated countries during the COVID-19 Pandemic. This study considered plan, selection and preparation of healthy foods as a Food literacy constraint. And considered gender, income for food, age, education, employment and no. of grown up in family were considered as covariates of healthy diet preparation skills. The outcome of this data were calculated with the help of 11 variables that catches behaviors in "planning (and managing)", "selecting", "preparing" balanced healthy foods. The output system were consist of a seven point frequency scale in which they told what things we should do (having more frequency) and what not to do (having least frequency). The Kessler (K6) scale was used to measure regarding predictors and psychological distress. And they also indicated respondents on a Seven point frequency scales having the same scaling, used for the indication of experience of the six feelings since COVID-19 Pandemic. The final result were measured which depends mean scores for plan, selection and preparation of healthy diet. And observe that it were measured average to high before the COVID-19 Pandemic/ before April 2020 in both the genders. All the three behaviors increased from average to high during this pandemic in both the genders. Further to this the financial stress was increased in both due to job losses in the pandemic. Due to COVID-19 Pandemic financial stress is increased in association with decreased plan and preparation of healthy foods [5].

3. TOP 15 COUNTRIES IN TERMS OF COVID CASES

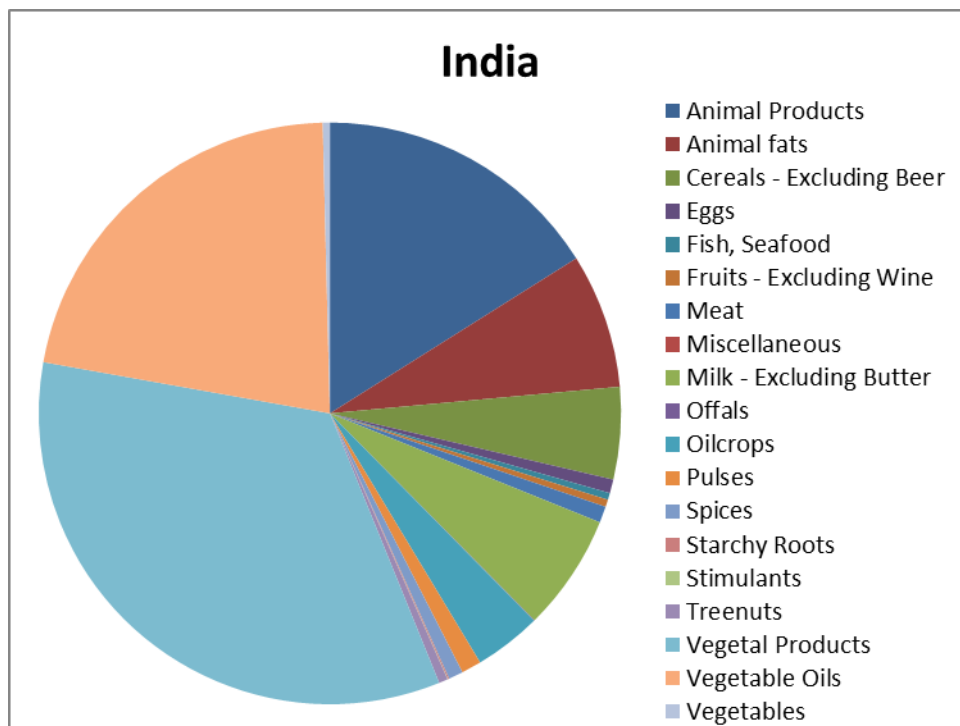
1.1 United States of America:



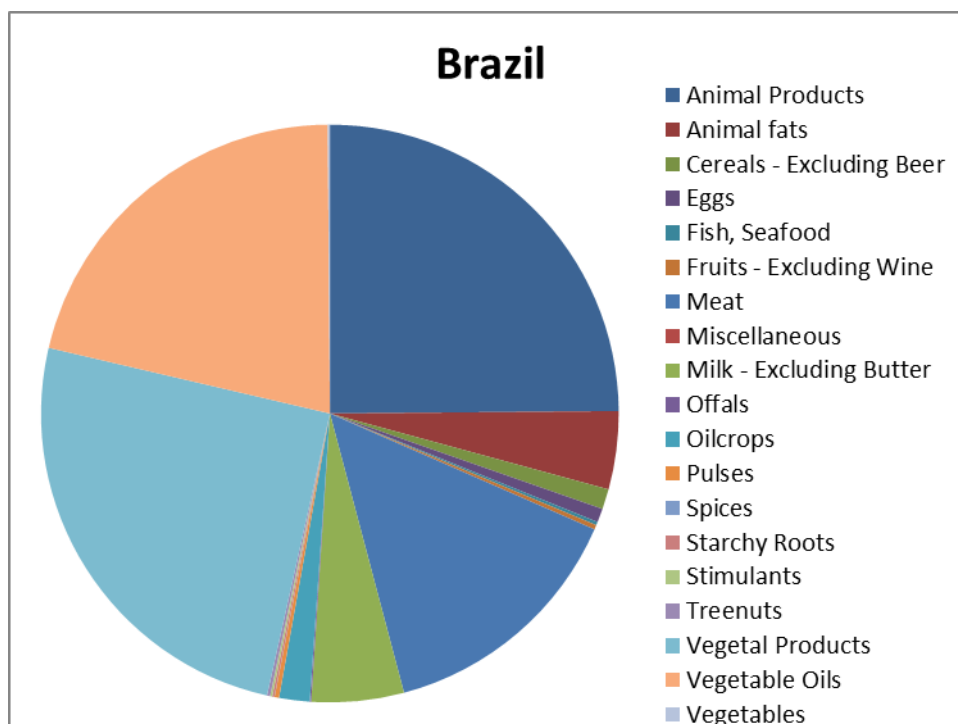
United States of America (USA) which is one of the powerful and developed country ranks 1st in terms of Covid cases in the world. In USA the cases are rising rapidly and in an uncontrolled way. The overall diet of the country is showed in the pie chart of USA. As we can see from the chart, that mostly consumed food items are Animal Products, Vegetable Products, Vegetable oils and Fish/Seafood. More than 75% of the consumption includes Animal Products, Vegetable Products and Vegetable oils. Overall diet habit is good but some more food items like eggs, vegetables, milk, pulses, fruits etc. are consumed in much less quantity. And we know that these food stuffs give us more proteins, vitamins, nutrients, etc. only these things are to be looked after else the remaining diet is good. As diet is an important part of a healthy life along with exercise and other related things, diet should be given importance. We can take of calorie trackers in our mobile phones which are now a day in highly used. These trackers not only track our calories but also water intake, sleep tracking, etc. easily with the help AI.

1.2 India:

India majorly consumes Vegetable Oils, Vegetable Products, Animal Products, etc. Also some moderately consumed food products are Animal Fats, Stimulants, Milk Products, etc. Mostly all the food products are consumed and also in proper proportion. But some food stuffs like Eggs, Pulses, Fruits, etc. is consumed in much less quantity and these are important to us. India is on second position after USA in terms of Covid Cases. The number of cases is more is because of lack of awareness among the people, less availability of medical facilities and also less use of available technology. To come out of this situation as soon as possible more efforts should be taken by India like development in infrastructure, making use of technology to create awareness among people, etc.

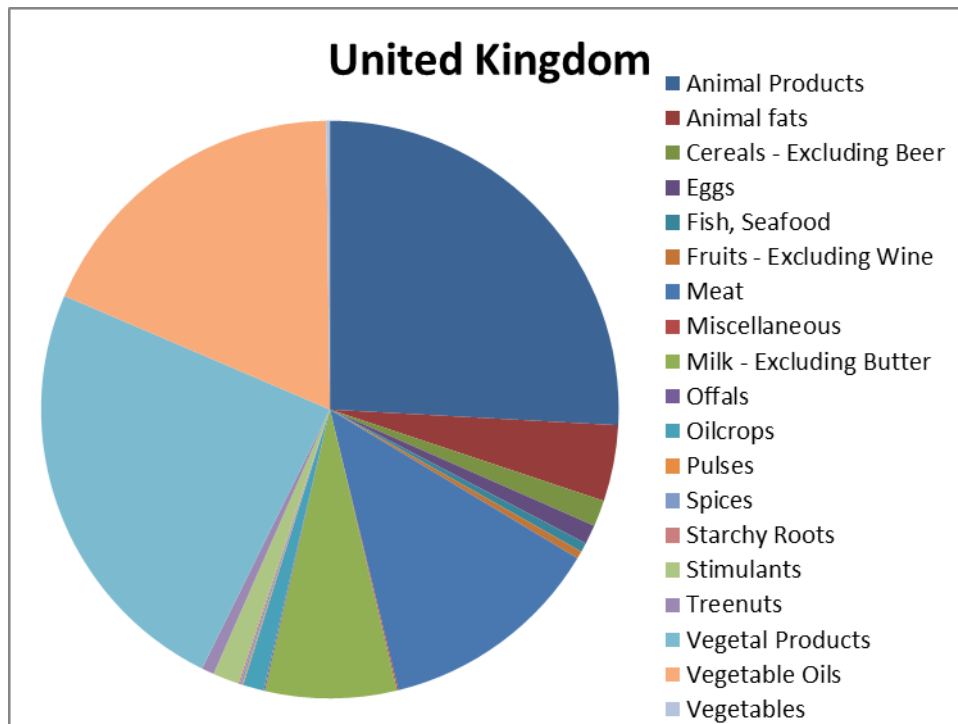


1.3 Brazil



Brazil ranks 3rd in terms of Covid cases in the world. If observe the pie chart of Brazil we see that almost everything which is important for human health is consumed in majority. The majorly consumed food products are Animal Products, Vegetable Oils, Vegetal Products and Meat, about 85% of the consumption includes these food stuffs. Brazil also consumes Milk, Animal Fats, etc. in a moderate amount. Compared to USA and India Brazil population has a very a balanced diet. But few things like Cereals, Stimulants and Pulses etc. are need to be included in diet. But then to the cases are more, it may be because of High Population Density, lack of infrastructure, etc. To fight against this disease development in infrastructure, creating awareness among the people about the precautions needed to be taken against it, use of social media i.e. mobiles or laptops etc. in short use to more new ways to stay safe.

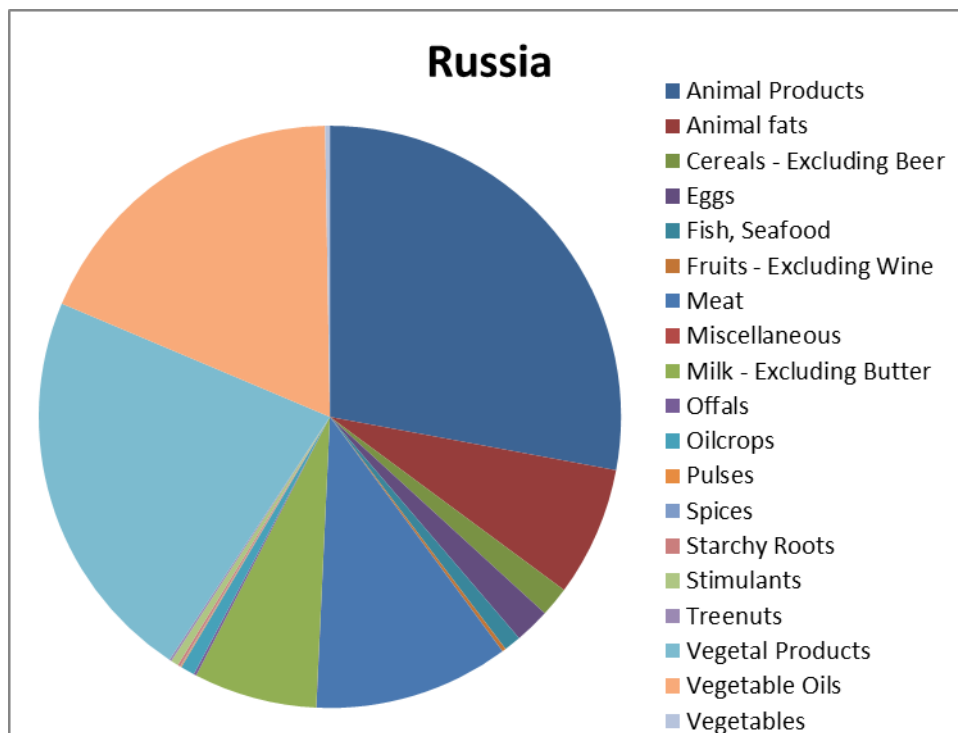
1.4 United Kingdom:



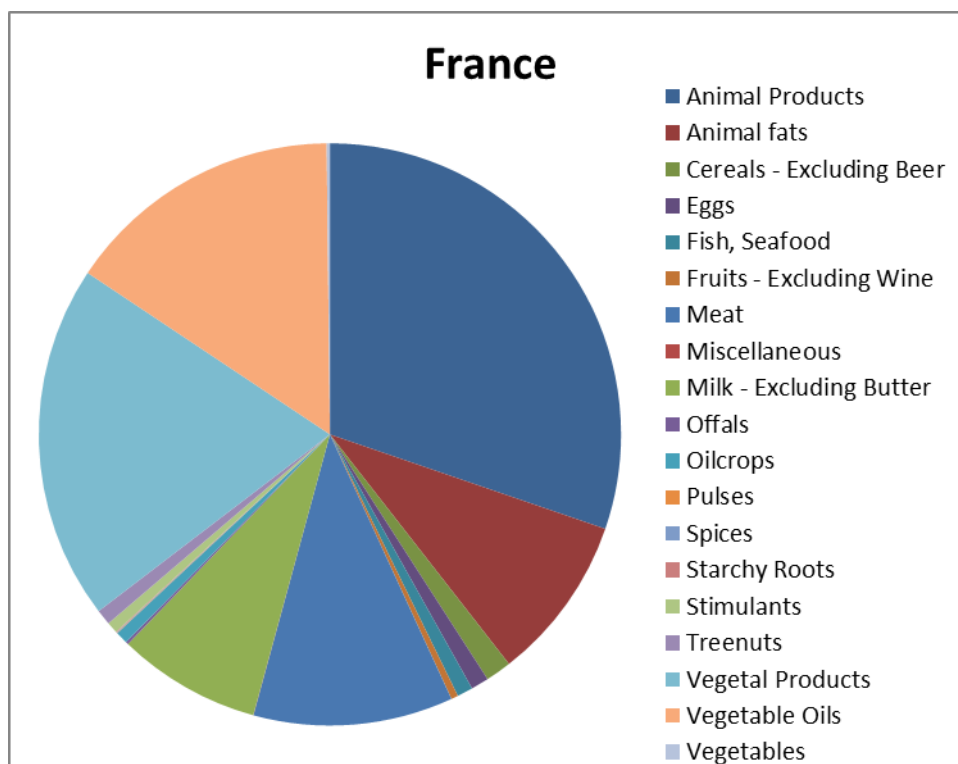
The pie chart of United Kingdom represents the diet of population in UK. United Kingdom ranks 4th in number of Covid Cases. About 75-80% of the diet includes Animal Products, Meat, Vegetal Products and Vegetable Oil. Moderately consumed food products are Milk and Animal Fats. Similar to countries like USA, India, Russia United Kingdom also lacks in areas of Pulses, Fruits, Stimulants, Vegetables etc. But overall if we observe the diet is well balanced except few things. United Kingdom has well developed infrastructure, good medical facilities, etc. but then there are more number of cases. If we compare the cases to USA and India they not much, still precautions should be taken. Now the conditions are getting better but citizens should take care of themselves. In association with diet people should also exercise at least twice or thrice a week.

1.5 Russia:

Russia stands on 5th position in Covid Cases. In the given pie chart of Russia we can see the distribution of diet which includes food items like Animal Products, Animal Fats, Meat, Milk Products, Fruits, Pulses, etc. More than 70% of the consumed food products are Animal Products, Vegetal Products, Vegetable Oils and Meat (Similar to other countries). Averagely consumed products are Animal Products and Milk Products. Russia too lack in Eggs, Cereals, Vegetables, Pulses, etc. Russia is already trying to control the situation by taking help of technology, awareness among people and citizens also should support from their end. This can be done by taking simple steps like Wearing masks properly, maintaining Social Distance, Sanitization, etc.

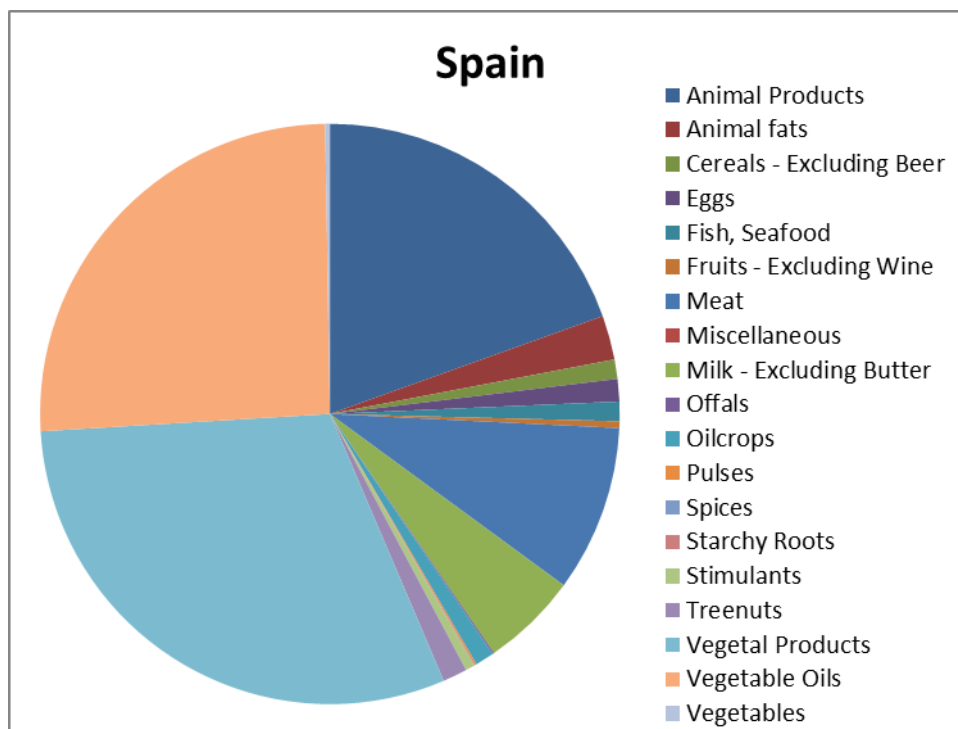


1.6 France:



The pie chart given represents the diet of population in FRANCE. As we can see in pie diagram animal products, seafood (fish), meat and milk are the main ingredient in diet. Some common food which are mostly consumed are full-fat cheese and yogurt, butter, bread, fresh fruits and vegetables, small portions of meat, wine, and dark chocolate. In this way French people take their diet [10]. France is already taking care of this pandemic, number of corona cases are getting low day by day. 36 million people are vaccinated till now and this process is going very fast so all nation is fulfilled by vaccination. Government of France is taking so much care of people's health so the country recover fast and grow economically again.

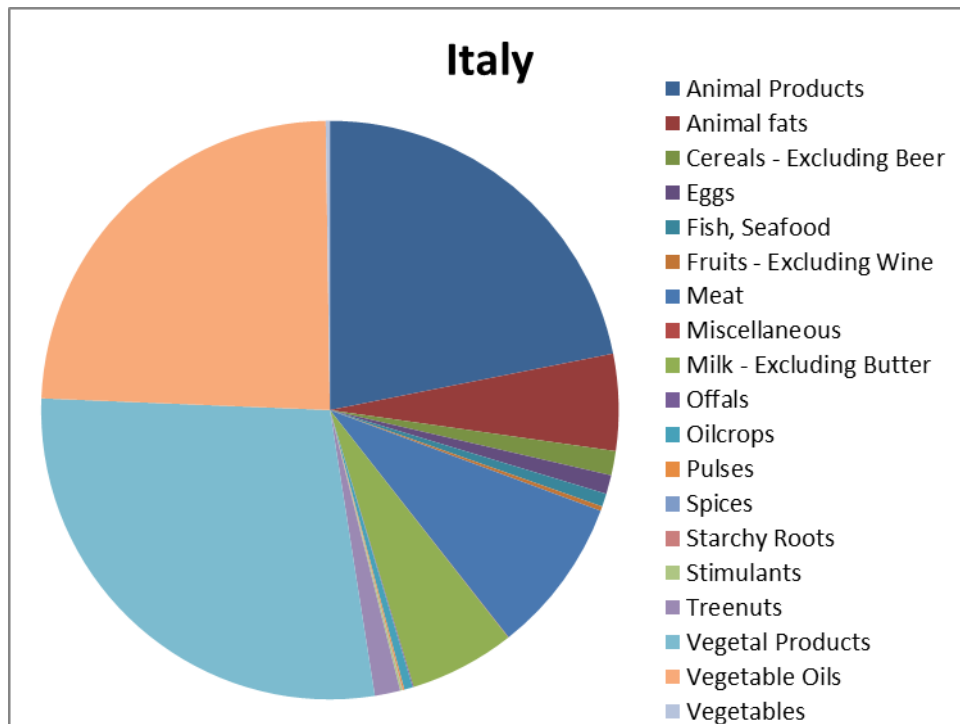
1.7 Spain:



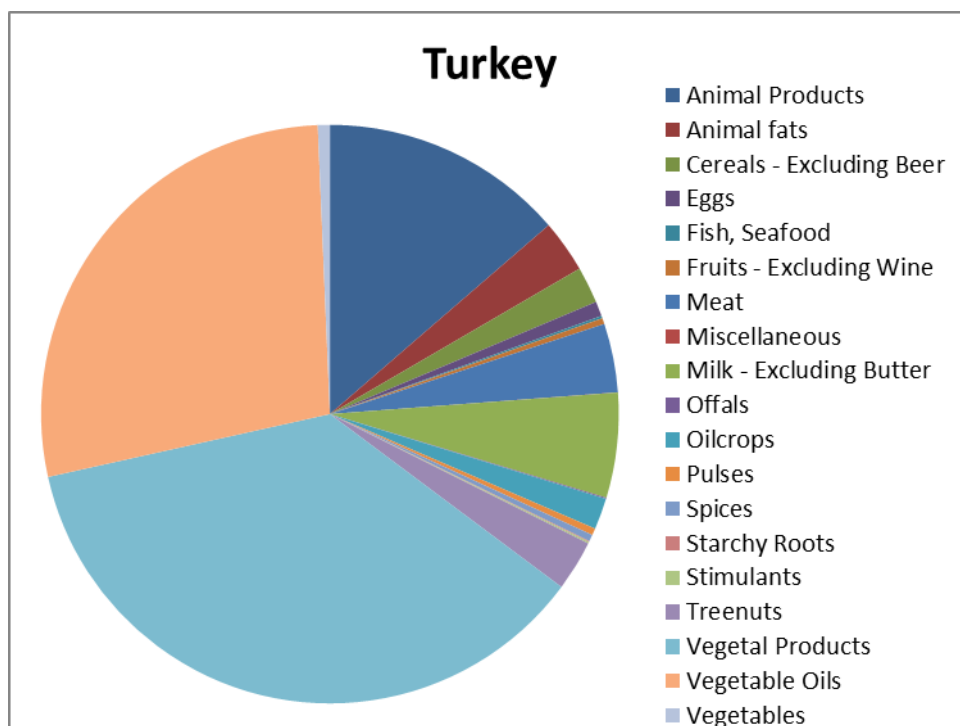
In Spain as you can see in pie diagram vegetable products, vegetable oil is majorly used in diet. Most of the people in Spain have milk and dairy products every day. Fish is also a major part of diet. Also some food products which consist of fats are also consumed. For example use of good fats, such as unsaturated fatty acids, omega-6 and omega-3 [8]. This country diet contains of nuts, pulses, fruits, cereals are used in small amount. The government of Spain is continuously working hard on getting situation better in country. Around 4 million people were affected in covid-19 virus and 40% of Spain getting vaccinated till now. Government announced that it will take 2 months more to get whole country vaccinated. People are so much aware now because of this tough situations and that's why they are taking healthy diet and doing yoga.

1.8 Italy:

Italy ranks 8th in terms of Covid cases in the world. Italy's pie chart is showing diet proportion of peoples in Italy. People of Italy include fruits, vegetables, fish, etc. As we can see in pie diagram vegetable oils and vegetable products are used too much in daily life food. Animal products and meat is also used in diet for more nutritious and healthy diet structure. Government of Italy is already taking care of increasing cases of corona and trying to reduce it day by day. In Italy 40% of people are getting vaccinated. And government is taking all the precautions to reduce cases and give vaccine to all population in country.

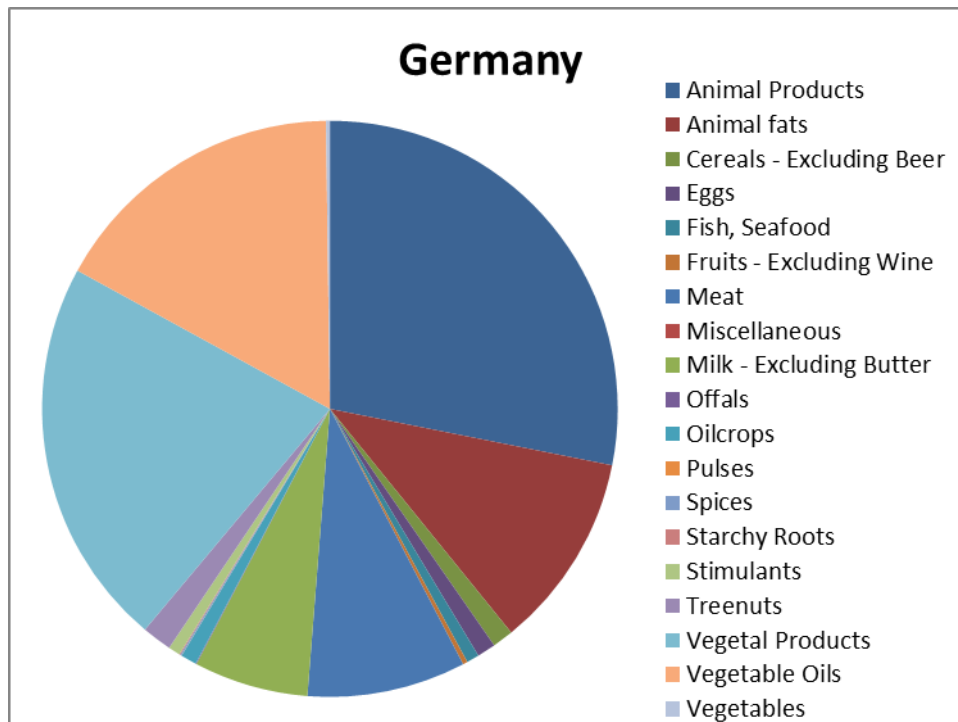


1.9 Turkey:



Turkey is present on 9th position in terms of Corona cases in the world. As we can see in pie diagram of Turkey it's about diet proportion of country. In Turkey about 60% of diet proportion is of vegetable products and vegetable. Moderate consumption of the fat content in Turkey includes meat, fish and animal products [9]. Turkey is a very rich source of protein. Apart from these nutrients, it is also contains zinc and vitamin B12. Government of Turkey is doing great job to reducing corona cases day by day [14]. 15 % of country is getting fully vaccinated. And they are trying very hard to vaccinate all country in two months. And along government peoples of turkey are taking care of their health by using sanitization process very well.

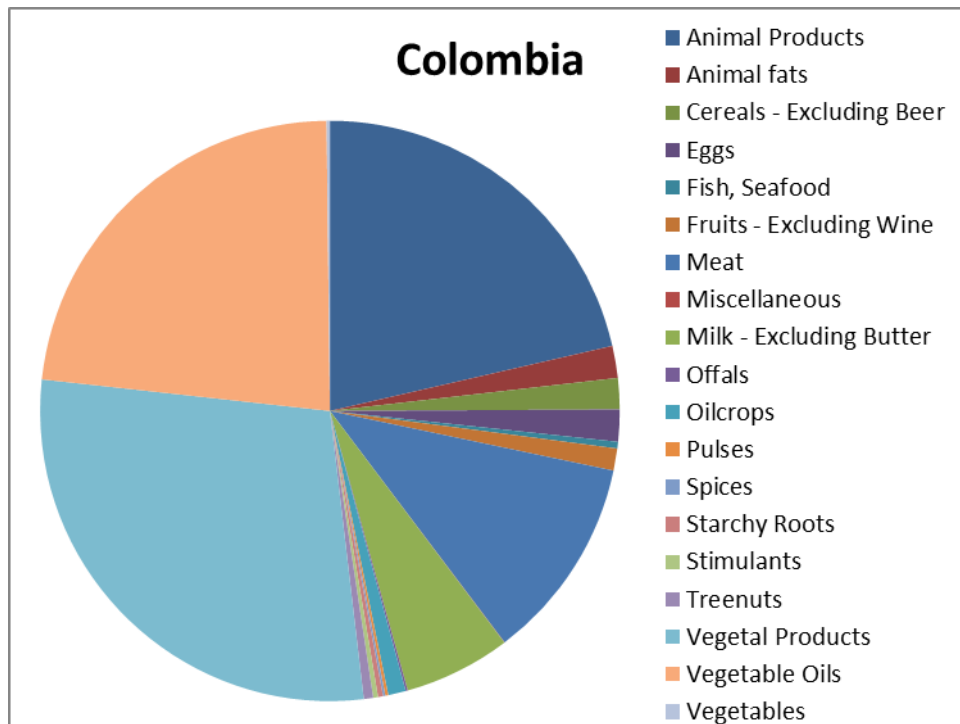
1.10 Germany:



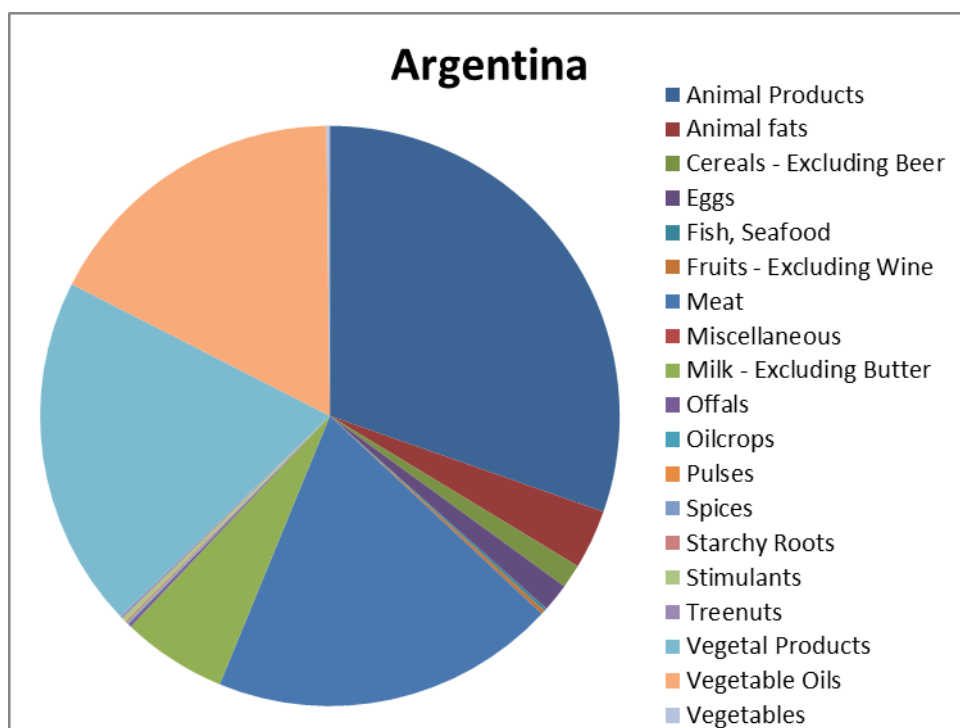
Pie chart of Germany shows the diet proportion of Germany. According to chart Germany uses the nutrition circle as its food guide. The nutrition circle is divided into 6 food groups: cereals and potatoes, vegetables, fruits, milk and dairy products, meat, fish and eggs and fats and oils. Vegetable oils, vegetable products and animal products are main content of diet in Germany. Other than this food they are taking pulses, spices, treenuts and fruits in daily life for more nutrition. Government of Germany taking care of people by giving vaccine to more than 3.6 million people and 45% of country is getting vaccinated by government. Peoples of Germany are so aware about this situation and they are taking care of themselves by using sanitization and wearing mask.

1.11 Colombia:

The pie chart of Colombia represents the diet of population in Colombia. As we can see in pie diagram animal products, vegetable oils and meat and vegetable products is the main ingredient in diet. Staple food of Colombia is rice, vegetable products, Vegetable oils, etc. [7]. There is a good variety in food habits depending on regions. Ingredients which are common are: cereals, meat, fish, etc. [13]. Colombia is already taking care of this pandemic, number of corona cases are getting low day by day. Till the about 32.9 lakh (approximately more than 5% of total population) people of the total population are completely vaccinated whereas 1.01 Cr people have taken their first dose. The governments as well as the people of Colombia are taking care of themselves in accordance to overcome from this pandemic.

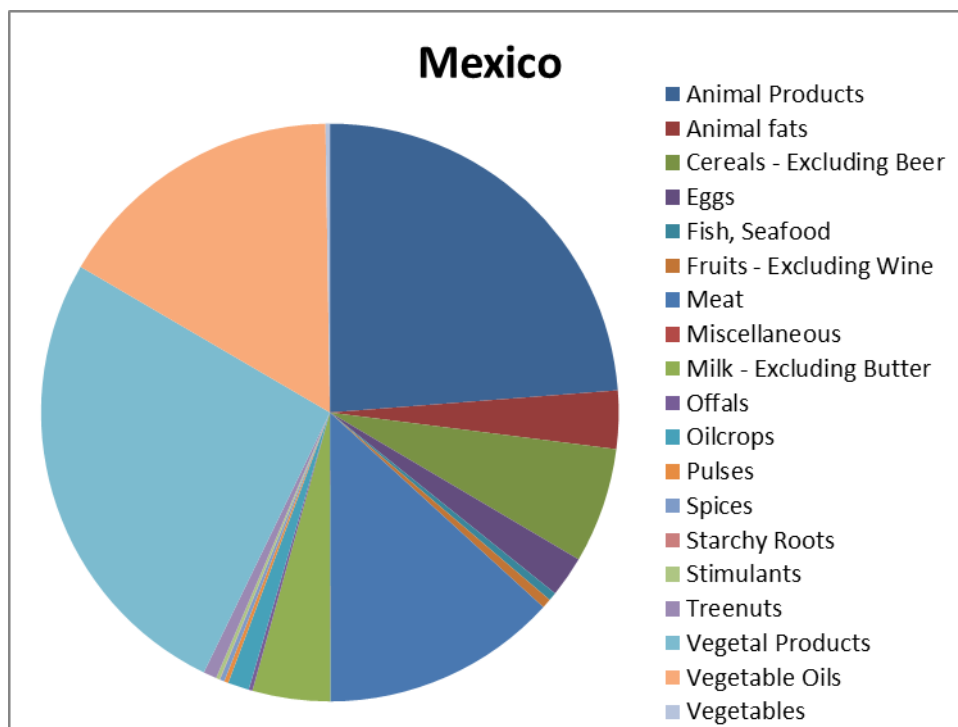


1.12 Argentina:



Argentina stands on 12th position in number of Covid cases. In the pie chart of Argentina we can see the distribution of diet in the pandemic situation. Where we can see more than 75% of the consumed food products contain Animal products, Vegetable products, Vegetable oils and Meat. Vegetables and salads are one of the common food habits of Argentines. Italian staples, such as pizza and pasta, are mostly preferred by the majority of the population, which is obvious and which causes more percentage of vegetable products and vegetable oils [7]. Government of Argentina is trying to take control on this situation with the help of technology and the people also taking care of all the essentials like masks, Sanitization social distancing and all.

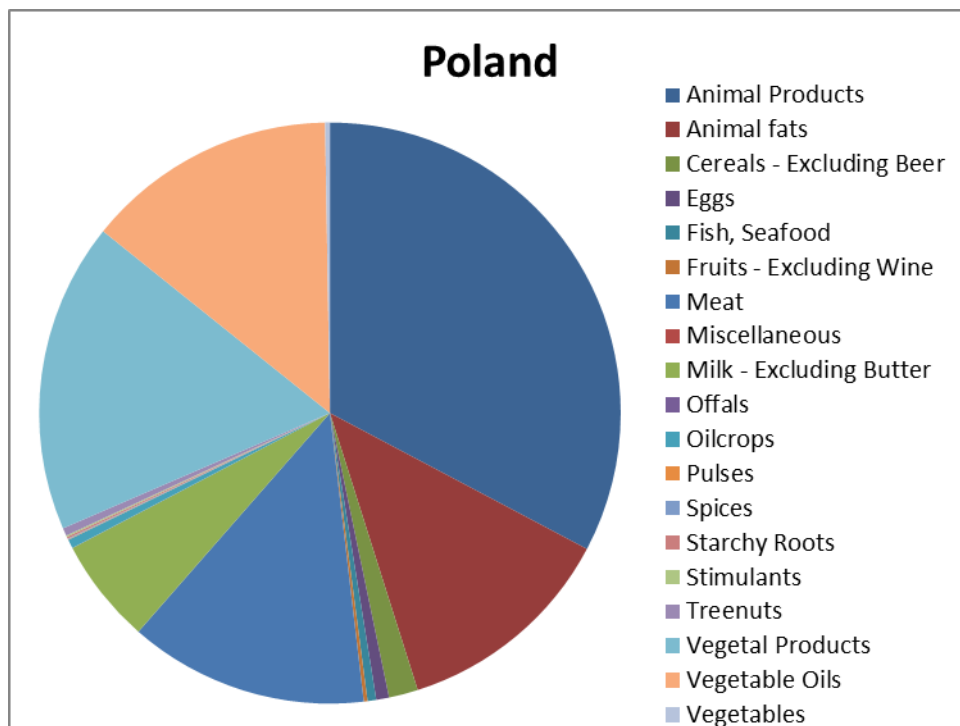
1.13 Mexico:



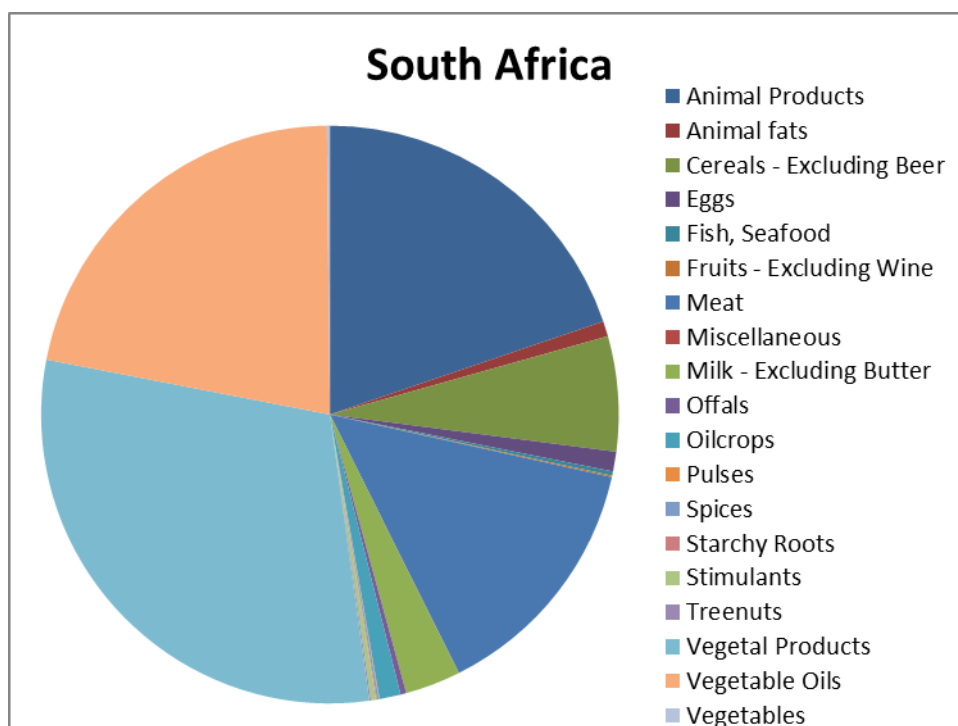
Mexico ranks 13th in terms of Covid cases in the world. Pie chart of Mexico is showing diet proportion of peoples in Mexico in the pandemic period. As we can observe from the pie diagram the most of the food in regular diet contain animal products, vegetable oils, vegetables and meat. The reason behind the more proportion of these products is the traditional Mexican diet because traditional Mexican diets are usually a mixture of citrus fruits, rice, meat, etc. [11]. The government is trying their best to control this pandemic situation and the population of Mexico also supporting them in it. Till this date 1.26Cr people are completely vaccinated which is about 9.9% of the total population and 3.1Cr people have taken their first doses. They are taking very much care about the lockdown and following the roles strictly to control this situation.

1.14 Poland:

Poland ranks 14th in the table of highest Covid cases over the world. The pie diagram represents the proportion of various contents in the diet of people of Poland. As we can observe about 80% to 90% of the diet contains animal products, vegetable products, vegetable oils, meat and animal fats. Poland is also characteristic in its use of cereals and grains [7]. Poland population and the government are very much known about the adverse effects of Covid and hence they are taking all the precautions, so the number of people vaccinated is much satisfying. About 73 Lakh of people get completely vaccinated which is 19.2% of the total population.



1.15 South Africa:



South Africa ranks 15th in the list of Covid cases. The pie diagram represents the various contents in the diet of African people. As we observe, we can see that most of the foods in the regular diet contain vegetable products, animal products, vegetable oils and meat. The South African food guide displays seven food groups to be eaten regularly: starchy foods, vegetables, fruits, fish, meat, eggs, milk, etc. which is the reason behind the more percentage of animal products and vegetable products [12]. Government of Italy is already taking care of increasing cases of corona and trying to reduce it day by day. Till the date 4.81Lakh people are completely vaccinated this is about 1% of total population. Peoples of South Africa are so aware about this situation and they are taking care of themselves by using sanitization and wearing mask.

4. CONCLUSIONS

In this paper we have given an overview on the diet of each country and its Covid cases of first week of February 2021. In these days, our health is at highest priority, for that our diet is also important. The data used consists of percentage (%) of intake of various Food Products like Animal Products, Animal Fats, Pulses, Milk Products, Fruits etc. and this is for each country. We have collected this data for 161 countries.

From this data we have made the following observations:

1. Arranged the data and then assembled them from highest to lowest in terms of Covid cases.
2. For the analysis we selected 15 countries having highest number of cases and the countries are: United States of America, India, Brazil, United Kingdom, Russia, France, Spain, Italy, Turkey, Germany, Colombia, Argentina, Mexico, Poland and South Africa.
3. Country wise diet distribution and food habits are given with the help of Pie chart and also explained in detail. If we observe carefully we come to know that most of the country's population lack in consumption of food products like Fruits, Pulses, Vegetables, etc.
4. If we observe for particular food item we get the following results:
*(NOTE: We have considered only mentioned countries and for consumption of food items we considered top 50 countries leading in consumption of that particular product.)
 - I. Animal Products: Poland, Argentina, France, Germany, Russia and United Kingdom.
 - II. Animal Fats: France, Germany, Russia, Poland, India and Italy.
 - III. Cereals: India, Mexico and South Africa.
 - IV. Eggs: Argentina, Mexico, Russia, Colombia, Spain and United States of America.
 - V. Fish: Russia and Spain.
 - VI. Fruits (excluding wine): Colombia and Spain.
 - VII. Meat: Argentina, Mexico, Brazil, Colombia, South Africa, United Kingdom, Poland and France.
 - VIII. Milk: France, United Kingdom, Russia and United States of America.
 - IX. Offal: Argentina, Mexico and South Africa.
 - X. Oil crops: India.
 - XI. Pulses: India and Turkey.
 - XII. Spices: India, Mexico and Turkey.
 - XIII. Starchy roots: Colombia.
 - XIV. Stimulants: United Kingdom.
 - XV. Treenuts: France, United States of America, Italy, Turkey and Spain.
 - XVI. Vegetal Products: India and Turkey.
 - XVII. Vegetable Oils: Italy, Colombia, United States of America, Turkey and Spain.
 - XVIII. Vegetables: India and Turkey.
5. If we observe we come to know that which food products are consumed by which countries (having most number of cases). If the product is non-vegetarian then most of the countries i.e. 6 to 8 countries are present in the list. But there is an exception and that is Fish, only fish is the non-vegetarian product which includes only two countries in its list.
6. If the food product is vegetarian then it includes on 1 to 4 countries. Here also there is an exception which is Treenuts, only treenuts are the one where 6 countries are present in the list.
7. So by looking at the outcomes we can say that the countries have more non-vegetarian consumption have more number of Covid cases and on the other hand countries have more vegetarian consumption have comparatively less Covid cases. Also the exceptions should be kept in mind.
8. We have also considered the data of Obesity, if we consider top 50 countries having high percentage of obesity then from our list of 15 countries like United States of America, Poland, Germany, Russia, South Africa, Mexico, Argentina, United Kingdom, Spain and Turkey i.e. almost all countries are present. We also know that obesity indicates towards less immunity, poor health, lack of exercise, etc. so obviously the cases are high in these countries.

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