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Title: Feeding Victory: The Challenge of Agriculture, Food Distribution, and  
Nutrition During the Second World War in the United Kingdom and Germany

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The Second World War was not just a military struggle but also a struggle between two different agriculture, food distribution, and nutrition systems in the United Kingdom and Nazi Germany. At the start of the war, both countries understood that food and nutrition would play an important role and carefully managed their agriculture and food distribution systems to support their military and civilian populations. The United Kingdom's goal was to feed their entire population throughout the war to survive the German blockade. The Nazi Government's goal was to gain Lebensraum or "living space" in Eastern Europe and to secure a stable food supply for Germany. The United Kingdom and Nazi Germany both viewed agriculture, food distribution, and nutrition as vital parts of the war and each country managed their systems the best way they thought possible. Based on English-language sources, this thesis compares policies and attitudes toward wartime agricultural production, food distribution, and nutrition in the United Kingdom and Germany during the war. The comparison reveals that these differences were not simply a matter of different access to natural resources; instead, political choices and differences in scientific perspectives shaped official actions by these respective governments.

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Feeding Victory: The Challenge of Agriculture, Food Distribution, and  
Nutrition During the Second World War in the United Kingdom and Germany

by  
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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

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Gus Paoli, Author

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## Introduction

The Second World War was a major conflict that occurred during the twentieth century. This war was not just fought on the battlefield but also on the homefront with agriculture and food distribution playing an important role in the wartime strategies of the United Kingdom and Germany. Both of these countries relied on their agriculture systems to feed their civilian population and to supply their war efforts. The governments of these two countries had similar difficulties with obtaining enough land for agriculture, distributing the food they had to their population, and meeting the nutritional requirements for their population.

Even though the governments of United Kingdom and Germany had similar problems with increasing food production, food distribution, and nutrition, they approached these problems in different ways. In order to increase food production, both countries had to focus on land use, labor, and improving production. The British attempted to use their land more efficiently which meant planting more food for people and increasing the amount of farmland by reactivating abandoned farms.<sup>1</sup> To increase their farmland, the Germans invaded Eastern Europe to use this land to produce food for themselves.<sup>2</sup> Both countries used women as farm laborers and relied on women to work in the fields while the men were away fighting. Another source of labor was Prisoners of War (POWs) who worked as replacements for the absent farmhands who were fighting in the war. This work by the POWs was permitted under the Geneva Convention because it was not directly related to the war effort. The Germans

also used forced labor from the occupied countries and transported many people from their homes to work on farms in Germany.<sup>3</sup>

The governments of the United Kingdom and Nazi Germany approached food rationing differently due to their political beliefs. Throughout the Second World War, the British Government was concerned that they would not have enough food to feed their population due to the German blockade. To counter this threat, the British attempted to divide the food available equally among the population. The British rationing system was very effective and was successful in preventing the citizens of the United Kingdom from starving. The German rationing system was very different and ethnic Germans received more food than other ethnicities.<sup>4</sup> The citizens of the occupied countries received less food than ethnic Germans and some groups were deliberately starved as part of the Holocaust. The population of the Channel Islands lived under both the British and German rationing systems during the war. The Channel Islands, located off the coast of France, are part of the United Kingdom and were occupied by Germany in 1940. The residents of the Channel Islands suffered from a shortage of food at the end of the war, and the British and German Governments worked together to feed these civilians.<sup>5</sup> The Germans also had to feed the POWs from the countries that they were fighting and these prisoners were treated differently due to their nationality. Once the food had been produced, both of the governments needed to distribute it among their populations to ensure that people received proper nutrition. During the 1930's there were many advancements in nutrition science and this affected how the two governments



distributed food. The British and Germans identified specific groups, such as pregnant women, children, and sick persons, that needed special nutritional requirements and attempted to feed these groups the best that they could.<sup>6</sup> The British were also concerned with the nutrition of their entire country and advised civilians about the best way to get proper nutrition. The Germans used nutrition as part of the war and intentionally denied some groups food to make them weaker.

Both of the governments were also concerned about animal nutrition because both countries had to decide whether to feed animals or humans with the food they produced. The British decided to slaughter many of their farm animals, while the Germans kept their farm animals for food and to be used as draft animals. During the Second World War, the Germans still heavily relied on draft animals to pull artillery and wagons for their military.<sup>7</sup> The Germans had to provide these animals with proper food and nutrition to ensure that they could still work. To adequately produce food, both countries had to make sure their plants were healthy and had all the nutrients they needed to grow. The British used pre-war surveys to decide what plants to grow where and used the ecological work of Charles Elton to protect their crops from invasive species. The Germans relied on fertilizer to help their crops grow, but fertilizer became scarcer as the war progressed.<sup>8</sup>

Both the British and Germans used their agriculture sectors as part of the war effort and agriculture played an important part in each country's war goals. The United Kingdom needed to withstand the German blockade in order to keep

fighting the Germans. The Germans wanted to secure a food supply for their population and colonize Eastern Europe.

Since the end of the Second World War, there have been numerous works published discussing the role of agriculture during the war. During and after the Second World War, the British Government wrote many reports explaining what role agriculture and food would play in the war. These British reports also included information about how the Germans were rationing their food and expanding their agriculture system to supply their population with enough food during the war. At the beginning of the Second World War, these reports focused on discussions about how the food supplies of both countries were divided and explained what groups of people had special nutritional needs. *The British Medical Journal* was a good source for this information because doctors wrote articles discussing their patients' nutritional needs.

The Germans' actions for confiscating food and colonization were also well documented during and after the war. During the Second World War, the Polish Government in exile published *The Black Book of Poland* which documented the German confiscation of Polish farms and agriculture products. After the end of the Second World War, there were reports published by both the British and German Governments to evaluate how their agriculture systems were impacted by the war.

For several decades after the war, most historians focused on the military and political aspects of the war and paid little attention to how agriculture and food distribution impacted the war. However, historians have recently started

reexamining the causes of the Second World War and have looked at the role agriculture and food distribution played during the war. The book *Nazi Hunger Policies: A History of Food in the Third Reich* by Gesine Gerhard focuses on the role food played in the Third Reich. The one aspect of the Second World War that historians have not examined is how the British and Germans used agriculture during the war and how these two systems compared and contrasted. A comparison between the British and the German systems is necessary to demonstrate how the United Kingdom and Germany responded to the nutritional needs of their human and animal populations during the war. Based on English-language sources, this thesis compares policies and attitudes toward wartime agricultural production, food distribution, and nutrition in the United Kingdom and Germany during the war. The comparison reveals that these differences were not simply a matter of different access to natural resources; instead, political choices and differences in scientific perspectives shaped official actions by these respective governments. We can see this particularly by analyzing the existing literature on land use policies, by examining the case of the Channel Islands food distribution problems, and by examining differing attitudes toward farm animals and plants

## **Chapter One: Food Production**

### **Introduction**

During the Second World War, both the United Kingdom and Germany changed their land use to produce more food for the war effort. The United Kingdom's main goal was to increase their own food production and prevent the starvation of their people.<sup>9</sup> The Germans were attempting to starve the United Kingdom into submission and had imposed a blockade against ships bringing supplies into the United Kingdom. Both countries had to make decisions about how to effectively use their farmland, how to efficiently employ farm laborers, and how to increase crop yields which caused the United Kingdom and Germany to develop different systems. Germany had a land advantage because they acquired the resources and farmland of the countries they occupied in Europe, while the United Kingdom had to manage their available land wisely because they had a set amount of land on the British Isles that they could use. Germany also had access to more laborers than the United Kingdom because they used forced laborers from the countries that they had invaded. Both the United Kingdom and Germany used POWs for agriculture labor because this was not against the Geneva Convention. The United Kingdom and Germany had to rely on the resources in their territory during the war because both countries imposed naval blockades against each other. The British could also transport resources into the United Kingdom from the British Empire, but this was risky and many ships were sunk during the voyage. Each country responded in a different way to the blockades due to their political and military situations.

The British and the German agriculture systems responded differently to the war. The British culled animals that were not needed, used their land for maximum productivity when possible, and attempted to set in place biosecurity around their fields. The United Kingdom's main goal was to holdout against German invasion and prevent the population of the United Kingdom from starving.<sup>10</sup> During the war, the German's agriculture plans were focused on expanding their empire and spreading Germanic people throughout Eastern Europe. They achieved this goal by invading land, evicting the local farmers, and replacing the farmers with German settlers.<sup>11</sup> These actions decreased productivity because novices replaced the experienced farmers who had knowledge about the area. The Germans also used the laborers ineffectively and relied on workers who did not want to work for Germany.

The three main ways to compare the German and British agriculture systems are by examining land use, laborers, and attempts to increase food production. When managing their available land, the British planned how they would use their land and what crops should be grown where, while the Germans mainly confiscated and invaded other countries that they needed. When organizing farm labor, the British system relied heavily on women and Italian POWs, while the German system used forced foreign workers and German women. In order to increase food production, the British slaughtered many animals such as cows and sheep. The fields that housed these animals were then used for farming or for more efficient animals such as pigs. The Germans

again relied on conquering land for more farmland and the use of fertilizer to increase their agriculture output.

### **Land Use in the United Kingdom and Nazi Germany**

The United Kingdom and Germany both had to properly manage their agriculture land during the Second World War and each country had its own reasons for deciding how to use the land. In some cases, these two countries had similar goals and in other cases, they were different. Both countries wanted to feed their populations to ensure victory in the war. Another common goal was encouraging farmers to become self-sufficient and to produce the feed that their animals needed. This was necessary because both the United Kingdom and Germany were cut off by naval blockades and could no longer import large amounts of animal feed. Farmers in the United Kingdom were encouraged to plant more crops to allow for more food to be grown for both animal and human consumption. Farmers in Germany were also encouraged to grow food for their own animals. The Germans also seized land from other European countries that they occupied to increase their food production for both animal and human consumption. The British had to manage their land more carefully than the Germans because the United Kingdom is an island country, meaning that they had access to less land, which led to the British becoming more concerned about their land use.

During the Second World War, the United Kingdom had to use their land for a variety of new reasons such as defense positions, airbases, factories, military training grounds, and agriculture. All of these uses had to be considered

when dividing the land area of the United Kingdom. During the 1930's, much of the available farmland in the United Kingdom was not being used to its maximum efficiency because farming was in decline, buildings were being constructed on valuable farmland, and farmers were moving to cities to look for work.<sup>12</sup> The United Kingdom could no longer grow enough food to support their population and was relying more on importing food to feed the population. The only food being produced in the United Kingdom was fresh foods, such as milk, vegetables, and bread, because these foods could not be transported over long distances. However, as it became apparent that there might be a war with Germany and the United Kingdom might be cut off from food imports, the British Government needed to decide what to do if a war broke out. The government was not too concerned about a blockade because they believed that they could stockpile enough food reserves to feed their population. Since the Royal Navy was the largest navy in the world, it was believed that enough food could be shipped to the United Kingdom even if the Germans attempted a blockade.<sup>13</sup>

Once the Second World War started, the British Government was able to stockpile food reserves but wanted to increase local food production in order to free up ships to transport war materials. To achieve this goal, the available farmland in the United Kingdom was examined to determine which crops should be grown in each field for maximum efficiency. In many cases, the farmland that had been abandoned was replanted and used for farming again. During the first two years of the Second World War, around two million acres of grassland in the United Kingdom was used for food production. Not all of this land had been

abandoned and some of it was still used by dairy and sheep farms. The farmers also planted grains and oats on these farms that could be used to feed their animals which freed up other farms to produce food for people.

Another step the British Government took was making sure that they were using land for the best purpose. If a plot of land was being used for grazing and there was no better use for it, the animals were allowed to continue to graze. However, if that land was better suited for producing food, it would be used for food production. Fortunately for the United Kingdom, there had been a survey done of the majority of land in England, Scotland, and Wales during the early 1930's and this enabled the British Government to quickly decide what crops to plant where.<sup>14</sup> In the United Kingdom, agriculture was seen as an extension of the war and increasing food production was stressed regardless of cost. This demonstrates that the British Government was concerned about their farmers' ability to grow enough food and understood the necessity to become self-sufficient.<sup>15</sup>

As the Nazis rose to power in 1933, they placed a significant emphasis on farming and agriculture because they believed that the ideal German was close to the land and was a farmer. The Nazis' main reason for expanding into Eastern Europe was to acquire new land for farming and agriculture. The Germans wanted to acquire this land to ensure adequate food supply and gain Lebensraum or "living space" for Germanic people. As the Nazis rose to power, they spread rumors that the farmland currently owned by Germany was not sufficient to feed the German population. In 1937, one German agronomist



argued against the Nazis and explained that Germany did have enough land to feed its population under careful management. However, since his ideas went against the Nazi Party, he was ridiculed by the Nazi press.<sup>16</sup>

In the years leading up to the Second World War, Germany lost some of its farmland to expand its military bases and manufacturing industries for the production of military equipment. Initially, the land needed by the military negatively impacted food production in Germany because so much ex-farmland was used for military purposes.<sup>17</sup> To help offset the loss of land, the German Government reclaimed land from the North Sea which then could be used for agriculture and food production. In 1935, the Nazi Government used concentration camp prisoners to reclaim 250,000 acres of land in Northwestern Germany from the North Sea. The land the Germans chose to reclaim is located at the mouth of the Elbe River and was intended to be a community for Aryan German Farmers.<sup>18</sup> Before the project, the land had been bogs, swamps, and flooded by the North Sea. The Germans believed that they could build 5,000 farms in this area to help increase the German food supply. The Germans were encouraged to reclaim this land after the Netherlands had success with a similar project.<sup>19</sup> After this German land reclamation project was complete, the Germans still wanted to increase their food production and had their sights set on Eastern Europe. When the Germans expanded into Eastern Europe, the problem of inadequate food production was solved.

Poland and the other countries of Eastern Europe were some of the best agriculture land in Europe and once the Germans took over this land, they began

to evict the Polish and Ukrainian farmers and replace them with German farmers. The farmers that were evicted were forced to leave the majority of their possessions behind for the German farmers to use.<sup>20</sup> Germany would continue to occupy these areas until close to the end of the war when German farmers fled before the Soviets arrived. The Germans that chose to stay or could not evacuate were then deported back to Germany by the post-war Soviet and Polish Governments and the land was returned to the Polish or Ukrainian farmers.

### **Labor on Farms in the United Kingdom and Nazi Germany**

Both the United Kingdom and Germany experienced a shortage of laborers in their agriculture sectors during the Second World War because the vast majority of young men had been drafted to fight. The United Kingdom and Germany responded differently to this labor shortage depending on their military situation and how well the country was performing in the war. Both countries relied on women and prisoners of war to replace the male farm workers. In addition, Nazi Germany used millions of forced laborers from the occupied countries in Europe. Although the United Kingdom and Germany both used women as farm laborers, their systems were significantly different. The British only accepted healthy and fit women into the Women's Land Army, while the Germans used large numbers of male and female forced and slave laborers who were often underfed and mistreated.

The Second World War caused many changes to British farms, and one of the most significant changes was that there were a large number of women working on the farms. Before the war, it was uncommon for British women to

work on farms and the only time that a large number of women had worked on British farms was during the First World War. Instead of working in the fields, women remained in the home taking care of the household duties or performing light farm work such as feeding pigs or collecting eggs. However, when men were called away to fight, women replaced them on the farms. The Second World War was not the first time that large numbers of British women had worked on British farms. The Women's Land Army that was active during the Second World War was a direct descendent of the same organization from the First World War.<sup>21</sup> By the end of the Second World War, over 100,000 women had joined the Women's Land Army and they contributed a significant amount of manpower to the British agriculture production. The experience of operating the Women's Land Army during the First World War helped the British because they knew at the start of the Second World War that they would need additional workers and what some of the requirements would be.<sup>22</sup>

The British Government wanted young healthy women to replace the male farmworkers and preferred women who had some experience in agriculture. For some of the women who had no previous experience in agriculture, a four-month course was setup at agriculture colleges and at select farms. Other women who had previous experience in agriculture were also educated at these facilities to earn a specialization in a specific field of agriculture. In addition to the fulltime farm workers, an auxiliary service was set-up to fulfill seasonal labor demands. The auxiliary services in the United Kingdom were important because, unlike the Germans, the British saw a decrease in the numbers of foreign workers during

the Second World War. The war had caused fewer Irish workers to come to Great Britain looking for seasonal work.<sup>23</sup> The Women's Land Army during the Second World War was a very successful organization because the British Government had experience from running a similar army during the First World War. During the Second World War, the British Government produced several pamphlets for women explaining how to apply for the Women's Land Army, giving advice for working on farms, and general information about farmwork.

The United Kingdom also benefited from some foreign workers who were primarily Italian POWs. During the early part of the war, the British captured many German and Italian soldiers, sailors, and airmen. The majority of German prisoners were not used for labor in the United Kingdom; instead, they were shipped to Canada to be interned until the end of the war. The majority of prisoners of war that the British used as farm laborers were the Italian prisoners. These prisoners were usually employed in jobs that required hard labor but were also assigned tasks such as milking. In the United Kingdom, these prisoners were normally kept in camps or on the farm that they worked on. They also had restrictions on their movement and could only leave their farms on weekends or with special permission. The British were pleased with the work done by the Italian POWs and the arrangement benefited both the British and the Italians.<sup>24</sup> The Italian POWs were not the only foreign workers in the United Kingdom. The British also had many foreign civilian refugees who had escaped from occupied Europe. In this group of foreign civilian refugees, there were also some German refugees who were in some cases interned even though they could have been

used as laborers. The foreign civilian refugees and the German refugees were investigated by the British Intelligence Services until it was determined that they were no threat and then they were encouraged to sign up for labor programs.<sup>25</sup> The foreign workers contributed a significant amount of labor on British farms and were an important part of the British war economy.

During the Second World War, the Germans suffered from many of the same problems that the British had with their farm workers. Millions of men were drafted or volunteered to serve in the German military which left many jobs vacant. Like the British, the Germans employed women, teenagers, and prisoners of war to work on the farms that they controlled. However, unlike the British, the Germans used forced and slave labor. These workers were brought from occupied countries to Germany and Eastern Europe to farm and work in agriculture. Throughout human history, it has been common for one army to put prisoners of war or captured civilians to work on farms or other industries. The largest known case of this happening was in Germany during the Second World War, with several million people displaced to work on farms or in factories.<sup>26</sup> This use of forced labor and slave labor made the Nazi German regime infamous throughout Europe.

Some of the foreign laborers brought from the European countries came willingly, but the vast majority of foreign laborers were forced to work for the Germans. The treatment of these workers varied depending on their "race." At the top of the racial hierarchy were "Germanic" people from Scandinavia, the Netherlands, and Flanders. At the bottom were the "lesser races" who were

Poles, Soviet citizens, Gypsies, and Jews. The people at the bottom of the racial hierarchy suffered brutal treatment and tens of thousands died of malnutrition, disease, and violence. Many of these people would have been exterminated if the Germans did not have an urgent need for workers.<sup>27</sup> In the Third Reich, working conditions were good for people considered "Aryan" (pure-blooded German) and there were laws governing the hours they could work and how they could be treated. Workers from Slavic countries were basically slaves and there were no laws regulating how they should be treated or how many hours in a day they could work.<sup>28</sup> The forced laborers employed in agriculture had a lower mortality rate at the end of the war because they were less likely to be killed since the Anglo-American air raids targeted the factories where many of the other forced laborers were employed.<sup>29</sup>

In addition to the foreign forced laborers, the Germans also used captured Allied soldiers, sailors, and airmen for agriculture labor. The Germans used these POWs to replace the German men who were serving in the Wehrmacht. In some cases, the German farms were assigned experienced men who had previously worked on farms; while in other cases, the German farmers received POWs who knew nothing about farming. In most instances, the POWs were a poor replacement for farmworkers, and the men who had experience on farms in their countries often found the farms they were assigned to in the Third Reich very different from the ones in their homeland. The experiences of the prisoners sent to work on the German farms varied because some prisoners were treated better than others. Some of the prisoners had a good relationship with their

German employers, while in other cases, the POWs loathed being sent to work on the German farms and the Germans hated the POWs.<sup>30</sup> The Germans did not like the POWs because they were the enemy living among German civilians and some civilians blamed the prisoners for the bombing of German cities and in some cases wanted revenge. One disadvantage for the Germans and the British when using POWs for labor was that German or British soldiers had to be used to guard the POWs which reduced the number of men available to fight.

Along with the foreign laborers, the Germans had a similar organization to the British Women's Land Army. However, the Women's Labor Service in Nazi Germany was not as effective as its British equivalent and was started for largely political reasons. After the Nazis rose to power, they established several youth labor organizations with the women's service being voluntary, while the men were required to serve for several years. The Germans made two mistakes when forming the Women's Labor Service: not conscripting women until the very end of the war, and making the Women's Labor Service more of a political tool instead of a practical one.<sup>31</sup> One of the goals of the Women's Labor Service was to train the women to work on farms or become a farmer's wife, not to increase food production. The Nazis encouraged women to volunteer because it would allow the Nazis to spread their propaganda and it allowed the Nazi Party control over young women in the Third Reich. The Nazi leaders did not want to conscript women because they were afraid that the German public would not support the war if women were conscripted. The Nazi leaders believed the public

would see this action (conscripting women) as the war not going well for Germany.<sup>32</sup>

The different ways that the United Kingdom and Nazi Germany used laborers demonstrates the different approaches taken by the two countries. The British used women and POWs for agriculture labor and both groups were very effective workers. The Germans also used women and POWs as farm workers. In addition, the Germans used forced laborers, who did not want to work for the Germans and who were kept in poor conditions. The Nazis' use of laborers was largely based on the Nazi racial hierarchy and ethnic German workers were treated much better than the others. The British decision to use women and POWs was based more on necessity, and the British Government attempted to use their workers to produce food as efficiently as possible.

### **Increasing Food Production**

The United Kingdom and Germany went about increasing food production differently. The British needed to properly manage their fields and increase food production by using better land management. The British had several advantages over the Germans because they were able to utilize studies that had been done before the war to plan their agriculture production.<sup>33</sup> British farms slaughtered many animals that were not needed for food to save on the production of animal feed, and they used the fields previously occupied by these animals to produce more food to feed the British population.<sup>34</sup> The Germans were able to obtain food and other resources from the occupied European countries. The farms in Germany and the Third Reich were not as mechanized



as the British farms and could not produce as much food.<sup>35</sup> To help increase production, the Germans produced large amounts of fertilizer to use on their farms. Even though these two countries attempted to increase their food production in different ways, they were both successful.

During the Second World War, the United Kingdom wanted to produce the maximum amount of food possible with the land that they had available on the island of Great Britain. Since the Atlantic shipping routes were threatened by German U-boats and dozens of merchant ships were sunk every month, the British Government knew that every scrap of food produced in the United Kingdom would help prevent starvation. Farmers in the United Kingdom did such an amazing job at increasing their food production during the war that they went from producing 35-40% of the food consumed by the British in 1938 to doubling food production in the United Kingdom by 1944. Along with an increase in food production, the British farms became almost self-sufficient and were able to locally produce the foodstuffs for their livestock too.<sup>36</sup>

British farmers slaughtered many animals, such as sheep, poultry, pigs, and beef cattle, which were not needed or were inefficient for food production. These animals were inefficient to raise because as they were taken off their pastures and these fields were used for human food production, it became necessary to import feed for the animals.<sup>37</sup> The British wanted to focus production on animals that would be more efficient and consume less food. The animals that were kept were dairy cows that produced milk or other meat animals that were raised on land that could not be put to a better use.

One advantage the British had over the Germans was that British farms were some of the most mechanized farms in the world before the war started. Many British farms used tractors for plowing, harvesting, and other tasks instead of animal-powered transportation. This meant that British farms required less labor and British farmers could plant and harvest their crops faster than the Germans. In Germany before the war started, the government was encouraging their farmers to mechanize. However, much of the German industrial production capacity was taken up by the military and there were no factories available to produce civilian tractors. The Germans were not able to take farm machines from Eastern Europe because these countries were not highly mechanized either. Despite the lack of modern farming equipment, the Germans were still able to use the land and resources of Eastern Europe.

After Germany invaded Poland, they annexed the western provinces into the Third Reich and began to deport ethnic Poles, Jews, and other non-Germans. By the end of 1941, it was believed that over 1.5 million people had been forcefully relocated from Western Poland and 500,000 German farmers had moved in to take their place. The Germans were able to export 700,000 tons of grain from this area which was a significant increase from the 200,000 tons exported before the war. However, this was not achieved through any major advantage of the Germans but was instead redirecting food supplies from Poland to Germany.<sup>38</sup>

The one area of agriculture that Germany outperformed the United Kingdom in was the use of fertilizers. Before the Second World War, Germany

had been a major producer of fertilizer and their agriculture heavily relied on it. During the war, German factories were able to continue to manufacture large amounts of fertilizer which allowed for increased food production in Eastern Europe despite the lack of labor and farming machinery. In contrast, the United Kingdom had lost much of its supply of fertilizer once the war started because the ships that carried the fertilizer were needed for other purposes.

### **Chapter 1 Conclusion**

Land use, farm labor, and increasing food production were important to both the United Kingdom and Nazi Germany, and both countries approached these problems differently. The British used their land surveys to decide where to plant crops and also used mechanization to plant and harvest faster, while the Germans focused on acquiring land from other countries. The British advantages were in mechanization, scientific land use, ecology, and labor. The German advantages were in the amount of land they had available, their ability to confiscate food and farm equipment from other countries, and the production of fertilizer. The use of agriculture in the Second World War demonstrates the differences between the Germans and the British in their approach to agricultural science. The Germans were heavily influenced by Nazi policy and ideas. This impacted many of their decisions and caused them to make some decisions that were inefficient, such as expelling the farmers who knew the land. The British used their scientific studies from before the war and were able to produce all the food they needed to feed their population. Even though the United Kingdom and Germany used their land, employed their labor, and increased production in

different ways, both countries had the same goal of increasing food production to feed their populations during the Second World War.

## Chapter Two: Food Distribution

### **Introduction**

Once the food was produced, the United Kingdom and Germany had to decide how to distribute it to their populations. Each country had their own approach to feeding their people and this was a product of their political and ideological goals. The German system divided people into groups and each group was given a specific amount of food. In Germany, workers were divided into three categories based on the type of work they performed: light, heavy, or very heavy. The Germans also used food distribution as part of the Holocaust when they deliberately starved certain groups. The British system was more open and free, and rations were placed mainly on protein, milk, and fats. In the United Kingdom, some items such as bread, potatoes, and special “off ration meals” were not rationed but were more expensive. The availability of food in the United Kingdom and Germany changed throughout the Second World War due to each country’s current military situation. For example, in the United Kingdom, people were allowed more for their weekly ration if there was a larger supply of the food. The Germans began to suffer food shortages towards the end of the war because they had lost much of their territory and it was becoming difficult to transport both food and military goods around the country.<sup>39</sup>

The British and Germans also had to feed enemy POWs and foreigners alongside their own populations. This affected the Germans more because they had occupied most of Europe and unlike the British, the Germans could not send captured enemy soldiers, sailors, and airmen to camps in the Americas. Instead,

the Germans had to feed these people. The treatment of these prisoners varied by country, and some nationalities, such as Americans and Western/Northern Europeans, received much better treatment than Eastern Europeans or other ethnicities that were considered “inferior” by the Nazis. One interesting situation during the Second World War was the Channel Islands which are part of the United Kingdom but were occupied by the Germans in 1940. The Channel Islands were unique because the population of the Islands was the only group under both food distribution systems during the war. Throughout the Second World War, both the United Kingdom and Germany viewed food distribution as an important part of the war and wanted to make sure their populations could be adequately fed.

### **The British System**

At the start of the Second World War, the British Government recognized that they needed to ration the United Kingdom’s food supply to ensure that all people got enough to eat and that there were no unnecessary shortages. Rationing started shortly after the war was declared and the only delay in activating the system was in issuing the population their ration cards. This delay was due to population movements as civilians were evacuated from some areas and reservists and active military members moved around the country.<sup>40</sup> The British set up a rationing system that attempted to divide the food equally among the population. In addition to rationing, the British Government also performed several scientific studies to see how people reacted to rationing and how their

eating habits changed. Another goal of the British was to cut down on food waste and make sure all available food could be used.

The British rationing system was very simple in theory: essentially it was a large division problem created by the Ministry of Food which took the total amount of the food resources and distributed it among the entire population. However, in reality, it was much more complex. The entire food supply could not be eaten at one time because some of the food needed to be leftover in case of an emergency, and some foods could not be stored indefinitely because they were perishable and would rot or spoil if they were left uneaten.<sup>41</sup>

At the start of the Second World War, the Ministry of Food realized that they needed to control the food supply to prevent shortages, and they started rationing food shortly after the war began. This was not an overnight seizure of all the food supplies but instead a slow process that occurred over several years. The first items rationed were imported foods, such as dried fruit and cereal, and locally-produced perishable foods, such as milk and butter.<sup>42</sup> As the Second World War progressed, the British Government obtained almost complete control over the food rationing and also controlled almost all imported and locally-produced goods. The British Government controlled the food supplies and the food distribution system by licensing the food transportation companies and food vendors.<sup>43</sup> Because the British Government had increased control over the food supply, this allowed the Government to move food around the country as needed and to prevent shortages by redistributing the food from areas that had surpluses.

During the early part of the Second World War, the British Government performed several scientific studies to determine what foods people were eating and how the rationing during the war had changed their eating habits. One study tested the caloric intake of eight people whose diet had fat, sugar, meat, and jam reduced. Other foods such as bread, potatoes, and vegetables were freely available and not restricted. It was determined that the people who participated in the study did not eat less under the rationed diet but made up the calories from other sources. The study concluded that as the supply of rationed food decreased, the amount of bread and potatoes eaten increased.<sup>44</sup> This study allowed the British Government to plan ahead and increase the supplies of potatoes and flour in case other foods became scarce. This planning helped the British Government be prepared for food shortages, and by 1941 the British rationing system had been set up and food could be divided into one of three groups. The first group of food that was rationed included foods such as butter, cooking fat, jam, tea, meat, and cheese. The second group was foods that were unrationed, but hard to obtain and included fruit, fish, cakes, sweets, cooked meats, and chocolate. The third group was foods that were cheap and easy to obtain such as potatoes, carrots, and other vegetables.<sup>45</sup>

The British used several different systems to ration the food. There were some foods that each person was only able to buy a fixed amount of each week and then they had to wait for the next week to purchase more. These foods were butter, margarine, fat, bacon, sugar, tea, and cheese.<sup>46</sup> Meat was rationed by value which meant that a person could buy more of a lower quality cut or less of



a high-quality cut. Even foods that were not officially rationed were often unofficially rationed by stores to prevent people from purchasing too much of one good which would then prevent others from buying it too.<sup>47</sup>

The British were also concerned about food waste and did not want food unnecessarily thrown out. To help reduce food waste in schools, the British conducted surveys of what foods the children liked and what they did not like, and there were also changes in food preparation to ensure that the food was eaten. One change that saved both food and water was cooking small amounts of vegetables at a time which improved their taste and meant more of them were eaten. The old way of cooking large batches of vegetables meant that the majority was thrown away because the vegetables became soggy and the children would not eat them.<sup>48</sup> The British schools were set up to provide children with regular meals, and there were several measures to ensure that this could be done. The easiest action was ensuring the food supply was distributed throughout the school buildings in order to prevent it all being destroyed or contaminated during a bombing attack. The second action taken was ensuring the kitchens had emergency power to continue cooking if the local power station or gasworks were damaged. The third action was ensuring that there were other schools where the children could be fed if their school was destroyed.<sup>49</sup>

The British rationing system was distinct because it focused on distributing food to the entire population. The British system gave people living in the United Kingdom choices on what they wanted to buy and allowed for more flexibility in nutrition and distribution. The British Government used studies to predict how

the population would react to rationing and attempted to have the necessary food supplies in place. The British had an advantage over the Germans because they could trade with other countries and import food from these countries. The Germans were unable to import food because they lacked the merchant fleet to transport food and the ships they did have were prevented from crossing the Atlantic by the Royal Navy. This blockade meant that Germany also had to ration food even though they controlled more land area. The United Kingdom was largely successful in their goal and prevented starvation in the United Kingdom during the Second World War.

### **The German System**

The German rationing system was very different from the British system and was focused on feeding Germany by taking food from the occupied countries of Europe. In some cases, the Germans used food as a weapon and starved certain ethnic groups as an extension of the Holocaust.<sup>50</sup> The German system was less fluid than the British one and the German population had fewer choices when it came to their meals. Despite these differences, Germans remained well fed until the very end of the war when their transportation systems began to break down. In the countries of occupied Europe, the Western countries fared better because the Germans allowed them to have more food.<sup>51</sup> In Eastern Europe, conditions were usually much worse because the Germans made it their policy to confiscate food and ship it back to Germany.

The German rationing system classified people into three categories depending on the type of work they performed. The work categories were

identified as light, heavy, or very heavy.<sup>52</sup> The German system was less flexible than the British system, and it was more difficult to tailor the diet for each person. As soon as the Second World War began, the Germans started rationing food and it was apparent that the Nazi Government was prepared from the start. Prior to the start of the war, there were already some food shortages in Germany. Foods that were not native to Europe, such as peanuts and bananas, had all but disappeared from German stores and because of the British blockades, it was impossible for Germany to import food from outside Europe. Another food that was difficult to obtain in Germany was fish, and even though it was not officially rationed, the war had almost closed the North Sea to fishing with very few trawlers making the trip.<sup>53</sup>

The Germans learned from their mistakes made during the First World War related to food shortages and poor food distribution, and when the Second World War began, they were ready to ration food. Food rationing in Germany began on August 27, 1939 several days before the Invasion of Poland.<sup>54</sup> The first items that were rationed were butter, sugar, meat, tea, fat, and milk. While the British relied on their points system, the Germans used a coupon system, with every citizen getting a specific number of coupons for each four-week period. Like the citizens of the United Kingdom, Germany's supply of food varied depending on the growing conditions and the weather. During the winter of 1941-1942, many potato and vegetable crops were inadvertently frozen but the produce was still eaten even though the freezing affected the taste. In Germany,

many of the fruits and vegetables consumed were seasonal, and once the supply was used up, there was no more.<sup>55</sup>

Even though the German rationing system started several weeks before rationing in the United Kingdom, the Germans were not as prepared and did not anticipate an increase in the demand for bread. At the outbreak of the Second World War, bread was not rationed in Germany. However, after several months, bread had to be rationed due to an increased demand. The Germans attempted to solve the flour shortage by adding potato starch and rye to the bread. The bread situation became worse as the war dragged on and by the middle of the war, it was difficult to find bread with a high percentage of flour.<sup>56</sup>

Although Germany experienced food shortages throughout the war, the food situation did not become serious until the end of the war starting in the winter of 1944-1945. Food became scarce at this time because of the bombing attacks against the German transportation networks.<sup>57</sup> These bombings caused the Nazi Government to have to reduce food rations and brought back memories of the hunger that plagued Germany towards the end of the First World War. Another factor that made the food situation difficult was that the Allied armies had captured much of the land that Germany had used for food production so there was not enough food being produced for Germany to feed its population.<sup>58</sup>

Even though the Germans had an adequate supply of food for most of the war, the same could not be said for the countries of occupied Europe. The Germans used the food from these countries to feed their own population and took food that would have otherwise been given to civilians in these countries.

For example, in Eastern Europe after the Invasion of the Soviet Union, the German soldiers were expected to feed themselves with the food in Russia. The Wehrmacht confiscated food from civilian farms and sent it to the German Army or back to Germany. This action caused a massive famine in Russia which led to the deaths of millions of civilians.<sup>59</sup> In Poland, farmers fared a little better than city dwellers because they grew food and could keep a little extra for themselves. As the war progressed, the Germans confiscated more food from Eastern Europe to feed German civilians and the forced workers in Germany.

The Nazis used food rationing as an extension of the Holocaust and not all people living in Germany were treated the same under the rationing system. From the start of food rationing in Germany, Jews living in Germany were discriminated against and there were additional restrictions placed on what food they could buy. Jews could only buy food from specific shops and they were allocated a reduced amount of eggs, milk, and butter. By 1942, Jews were prohibited from buying these products because Germany was experiencing shortages and the food was directed to ethnic Germans.<sup>60</sup> In addition to restricting the shops where they could buy food, the Nazis also restricted the time when they could buy food and only allowed Jews to shop in the evening after the best food had already been taken.<sup>61</sup> Also, the Nazis intentionally starved Jews living in ghettos and concentration camps throughout Europe.

### **The Channel Islanders and the POWs**

During the Second World War, the Germans conquered much of Europe and in addition to the population of Germany, the Germans also had to feed the

populations of the occupied European countries and the Allied POWs. In many cases, the Nazi racial hierarchy applied to these groups too and what ethnic group the people were part of correlated with how well they were fed. The citizens and prisoners from Western and Northern Europe were fed better than the prisoners and people from Eastern Europe. The Germans also had to decide how to feed the civilians in the areas that they occupied. In many cases, these areas were considered part of the Third Reich and fell under the German system. However, the Channel Islands located off the coast of France are a notable exception.

The Channel Islands, which are part of the United Kingdom, were invaded by the Germans in June of 1940 shortly after the fall of France. Initially, the Germans were amazed at the amount of food and other supplies on the Channel Islands because some of these items were already difficult to obtain in Germany. The Channel Islands did not have a food problem until late 1942 and early 1943 when the war began to turn against Germany. In response to these food shortages, the Islanders and German soldiers started stealing food from farmers and from each other. It was common for farmers to report the theft of small animals such as rabbits and chickens. The food shortages also caused people to experiment with new foods such as seaweed and Carrageen moss.<sup>62</sup>

Towards the end of the Second World War, the British and the German Governments worked together to feed the civilian population on the Channel Islands. The food situation on the Channel Islands became even more treacherous in late 1944 due to the Allied invasion of France. When the Allies

invaded France, the Germans could no longer import food due to a blockade of the Channel Islands. In November 1944, it was estimated that the Channel Islands only had enough food to last one or two more months. The civilians on the Channel Islands were on the edge of starvation and the Bailiffs (governors) of Jersey and Guernsey Islands sent letters to the International Red Cross in Switzerland asking for aid. The British and Germans agreed to allow the Red Cross to supply food aid to the civilians and on December 27, 1944 the Red Cross ship *SS Vega* arrived with 100,000 food parcels for the Islanders. The *Vega* returned to the Channel Islands several times before the war ended to supply the civilian population of the Channel Islands with more food.<sup>63</sup> The German soldiers stationed on the Channel Islands were not allowed to eat the food from the Red Cross and had to survive on stored food or food grown on the Channel Islands. There was not enough food to go around, and many of the German soldiers suffered from malnutrition towards the end of the war.<sup>64</sup>

In an interesting twist, the civilians living on the Channel Islands were getting more food from the Red Cross than the German soldiers were when eating their meager rations. In order to survive, German soldiers resorted to stealing dogs, cats, rabbits, chickens, and other small animals to cook.<sup>65</sup> The British civilians living on the Channel Islands had some advantages over civilians living in other occupied European countries because the British Government in London could send food aid through the Red Cross which prevented mass starvation on the Channel Islands at the end of the war. Another advantage for the Channel Islanders was that the Germans soldiers were ordered by their

superiors to treat the Islanders with respect and not cause any unnecessary hardship. The rationing system imposed on the Channel Islands had some health benefits for the Islanders during the early part of the war. People were eating healthier and doctors reported that many overweight patients lost excess weight during the war. However, as food became scarcer during the last years of the war, both the German soldiers and Channel Islanders were suffering from the lack of proper food and nutrition.<sup>66</sup>

The Channel Islanders were not the only citizens of the United Kingdom and commonwealth countries to live under German rule during the war. The Germans captured soldiers, sailors, and airmen from the United States and other occupied European countries, and there were millions of POWs who had to be fed and cared for by the Germans. These prisoners can be divided into two groups: one group being the Anglo-American and other Western European prisoners, and the second group being POWs from the Soviet Union and other Eastern European countries. The POWs from Western Europe and the United States were treated relatively well and kept in conditions that largely followed international law. In contrast, POWs from Eastern Europe and the Soviet Union were often starved and kept in appalling conditions.

The reason for this difference in treatment is largely due to the Nazi Party's views on Eastern Europeans and communists. The Nazis believed that the Germanic people were superior to Eastern Europeans and also saw Communism as a threat and attempted to eradicate it from Europe.<sup>67</sup> These beliefs led to Germans massacring Soviet POWs and deliberately starving many



to death. The Germans intentionally took food away from these prisoners in order to transport the food back to Germany to feed to the German civilians or to feed the German soldiers in Russia.<sup>68</sup>

The prisoners from the United States and Western Europe were generally fed better than Soviets and Eastern Europeans. After the surrender of Western Europe, the Nazis released many of the prisoners from France, Belgium, the Netherlands, Denmark, and Norway.<sup>69</sup> This release was largely logistical because the Germans did not have the manpower to guard or house them. As the war began to turn against Germany, many of the men who were former prisoners were brought back to Germany as “guest workers” where they suffered without the protection from the Geneva Convention.<sup>70</sup>

The Prisoners of War from the United Kingdom and the United States often received better food rations than other POWs. One possible reason for this better treatment is that the British and Americans had thousands of German POWs in their custody, and each side treated the other country’s prisoners well to ensure that their own men would not be mistreated.<sup>71</sup> At the beginning of the war, the POWs from the United Kingdom were fed well and in accordance with the Red Cross standards which required the prisoners to be given the same rations as the German soldiers. As the war progressed and as the food situation in Germany and occupied Europe became more critical, the rations fed to the prisoners decreased. Unlike the Soviet and the Eastern European POW camps, the British and American camps were inspected by the Red Cross and Red Cross packages were mailed to the British and American prisoners. These

packages were intended to supplement the German supplied rations.<sup>72</sup> In 1944, many prisoners were still being well fed and when the Red Cross inspected a camp for British prisoners, the inspectors found that the prisoners' rations at this camp were similar to the German soldiers' rations, meaning that the Germans fed the POWs similar food to their own soldiers' rations. However, the inspectors also found that there was a shortage of food, and that there was not enough food stored at the camp to feed the prisoners if supplies were cut off.<sup>73</sup> At other camps, the situation was much worse and there was very little food for the POWs and they relied on the Red Cross packages for survival.<sup>74</sup> These two examples demonstrate that by the last two years of the war, the Germans had a food distribution problem even for the prisoners that the Germans were attempting to feed well.

The POWs and foreigners in the Third Reich had very different experiences with food distribution. For the Channel Islanders and POWs from the United States and Western Europe, conditions were generally good until the end of the war when the German food distribution system began to break down. For the POWs from Eastern Europe, the situation was very different and the Germans intentionally starved millions to death.

## **Chapter 2 Conclusion**

When comparing the food distribution systems of the United Kingdom and Germany, it is easy to see that they were vastly different. The British planned more for rationing and performed several studies to predict how their population would respond. The British system allowed for the citizens to plan their own

diets, and the people were able to choose which foods they purchased and ate. The British system also attempted to distribute food equally among the population instead of favoring a certain group. The German system was intended to feed the population of Germany while depriving other groups of food. The Germans' policy of confiscating food from occupied European countries led to widespread famine which caused nutritional deficiencies.

During the Second World War, food distribution was not just impacted by availability but also influenced by the difficulties of transporting food to the consumers. The British had an advantage over the Germans in transporting food because the British Government knew how the distribution system was set up and operated in the United Kingdom. All the British Government needed to do was regulate the businesses that imported food and the businesses that distributed the food in order to establish their rationing system. The Germans had to rebuild infrastructure that had been damaged by the war. The Germans had also occupied many other European countries and were unfamiliar with how these countries distributed their food.

The rationing systems in the United Kingdom and Nazi Germany show how each country approached the needs of their populations. The British system looked at their entire population as a whole, while Germany's system divided their population into groups along both work and ethnic lines. The Germans used food as a weapon of genocide against some groups in their policy of eugenics and attempted to eliminate "inferior races." One goal both countries shared was to ensure that their populations were fed throughout the war.

## **Chapter Three: Health and Nutrition During the War**

### **Introduction**

Even though food production and food distribution are important in their own right, health and nutrition are also important. Both the United Kingdom and Germany realized that they needed to provide proper nutrition to their citizens, along with proper nutrition for farm animals and plants. The people needed proper nutrition to be healthy enough to work at their jobs or to serve in the military. The farm animals in both countries required proper nutrition in order to produce food effectively and to be healthy enough to be used as draft animals. The crops grown in each country needed to be planted correctly, have enough nutrients, and be protected from any animals or weather that could harm them.

Both the United Kingdom and Germany wanted their citizens to receive adequate food and nutrition throughout the war in order to maintain their health. The British made a special effort to make sure that the lower classes could afford enough food to remain healthy. The Nazi German Government had a similar goal as the British but proper nutrition was reserved for only ethnic Germans. However, both countries realized that the sick, pregnant women, and children needed more nutrients and attempted to give these groups the proper food supplies.

The United Kingdom and Germany responded differently to the nutritional needs of farm animals and draft animals. The British slaughtered many animals that they could not adequately feed, while the Germans kept the majority of their animals. This difference between these two countries is most clearly shown with

horses. The Germans still relied on animals to plow their fields and pull artillery and supply wagons for the army. The British were more mechanized, so they had little need for horses. This reliance on horses would prove difficult to the Germans because they needed to provide the horses with feed and nutrients to make sure they were strong enough to work.

The United Kingdom and Germany were very different in their responses to plant health and nutrition. The British focused on ensuring that their fields were biologically secure and that invasive species or other animals would not damage crops. The Germans were less concerned about plant nutrition because they had access to fertilizers and had much more land than the United Kingdom which allowed the Germans to produce more food. The food production system in Germany was less impacted by the weather conditions or pest animals (mice, rats, and rabbits) because the German-controlled farms were spread over an entire continent. If there was a problem on the farms in one area, the Germans could still produce food in another location. In addition to growing food, both countries researched health and nutrition during the Second World War and this research helped both the United Kingdom and Germany distribute food to their populations, give their animals proper care, and grow crops effectively.

### **Human Health and Nutrition**

During the Second World War, the governments of both the United Kingdom and Nazi Germany were concerned about the health of their populations. These two countries encouraged some of the same habits for their people, such as eating healthy foods, receiving proper nutrition, and giving

special rations to certain groups that were at higher risk of disease or malnutrition. These two countries also conducted research in nutrition science but performed this research in different ways. The British conducted surveys on what people were eating and compared their diets to the dietary standards recommended by doctors, while the Germans performed human experimentation on prisoners to test out different diets.

When the war started, the British Government knew that providing proper nutrition to the population of the United Kingdom would be important for outlasting any blockade. The British learned from several mistakes made by the Central Powers (the German Empire and the Austro-Hungarian Empire) during the First World War. The populations of these two empires suffered from an abnormally high rate of food-deficiency diseases brought about by the lack of food during the First World War. The British believed that the Central Powers had enough food to feed their populations, but they did not ensure that people had adequate nutrition.<sup>75</sup> To prevent the citizens of the United Kingdom suffering the same fate, the British wanted to make sure that their citizens received an adequate amount of vitamins, minerals, and fats each day. To achieve this goal, the British Government attempted to make sure that civilians and military personnel ate a variety of foods. Two foods that were beneficial from a nutritional standpoint were butter and margarine because these foods could have additional vitamins and minerals added to them to help people reach nutritional goals.<sup>76</sup> Margarine and butter were not the only foods that would help people in

the United Kingdom eat a healthy diet and special attention was also given to bread, milk, potatoes, vegetables, fruit, and meat.<sup>77</sup>

During the early part of the Second World War, the British Government received advice from doctors who worked at nutritional institutions and research hospitals on the best way to feed the British population and ensure that people were eating healthy. These doctors made several recommendations about how to improve nutrition: providing healthier food, encouraging people to change their diets, better meal planning, and cooking food properly.<sup>78</sup> The British rationing system provided people with higher quality food because many of the foods were cheaper than they were in peacetime and increased wages meant that people could buy more food. The rationing system also restricted the foods people could buy so the British Government recommended that people change their diets and plan their meals for the duration of the war. In the United Kingdom, the majority of people preparing meals for families did not understand the nutritional needs of children well enough to adequately plan meals. To solve this problem, the general public was educated about human nutrition which enabled them to eat healthier. This education also included how to properly cook food to save the nutrients in the food. For example, schools had been cooking vegetables in large batches early in the day and then letting them simmer until lunch. This practice caused many of the nutrients such as Vitamin A and Vitamin C to be destroyed by the heat.<sup>79</sup> The doctors' recommendations helped the British population to eat healthier during the war and in many cases the rationing system improved the health of some people.

The British selected certain groups of people that needed additional nutrition and attempted to give these groups better nutrition. These groups included children, pregnant women, and sick persons. When children were fed at the school they attended, it was easier to ensure that they received proper nutrition because they were fed meals prepared by the school staff. In some cases, the children were polled to discover which foods they liked and which ones they did not like.<sup>80</sup> The cooking staff at the schools attempted to make balanced meals that the children would eat in order to prevent food waste or the children not getting proper nutrition because they were only eating part of the meal. Pregnant women were also given special care with an emphasis on getting enough vitamins and minerals. Women who were pregnant or nursing were encouraged to get more of Vitamin C and Vitamin D to maintain their health. The British based this recommendation off nutritional standards set by the League of Nations during the late 1930's.<sup>81</sup>

Within the first year of the Second World War, doctors in the United Kingdom realized that sick persons might need extra rations to help with their recovery. The British set up a special committee to identify groups of people that would be at higher risk of malnutrition due to disease and recommended that these groups get additional rations. These extra rations included additional portions of butter, margarine, meat, and sugar. The extra rations were easy to obtain, and a person needed to fill out an application and get a doctor's approval in order to get these rations.<sup>82</sup> However, this system was not perfect and some doctors were concerned that their patients were still not getting adequate rations



because their application had been denied or some diseases were not included under the program. Some doctors were concerned that not enough attention was paid to the sick people and that more people would become sick as the war progressed.<sup>83</sup>

The German Government also paid special attention to the nutrition of children, sick persons, and pregnant women. However, unlike the British rationing system that applied to the entire population equally, the Nazis favored ethnic Germans by giving them foods that provided better nutrition throughout the war. The German rationing system followed the basic Nazi racial hierarchy with ethnic Germans at the top, followed by Northern and Western Europeans, and Eastern Europeans, Slavs, and Jews at the bottom. The contrast between these groups is sharp with many ethnic Germans getting adequate nutrition throughout the war, while other groups were deliberately malnourished.

German children, sick persons, and pregnant women received some nutritional benefits in the Third Reich such as having access to fresh fruit and additional food. In the Third Reich, German children were allowed an extra ration of noodles, honey, and fruit. To outside observers, German children seemed well nourished and it appeared that by the end of 1943, the war had not negatively impacted their health in any significant way.<sup>84</sup> Pregnant women were able to have an extra milk and meat ration to help with the pregnancy which had to be confirmed by a doctor or midwife.<sup>85</sup> Much like the United Kingdom, the Germans were concerned about tuberculosis and allowed sick persons extra rations which included 250 grams of butter, 3½ liters of milk, and three eggs per

week. Another group of people that the Nazi Government paid special attention to was blood donors and a person who donated blood was allowed extra meat for two weeks after the donation.<sup>86</sup>

Unlike the ethnic Germans, the civilians living in occupied Europe suffered from poor nutrition during the war. However, the conditions varied depending on where a person was living and what food was available. In France and Belgium during the first few months of the German occupation, people ate foods similar to the foods that they had eaten before the war and their diet and nutrition remained largely the same. As the Germans began to take food from these countries, the situation became worse and the civilians began to suffer from poor nutrition.<sup>87</sup>

One difference between these two countries and Germany was that bread was not standardized which led to some areas receiving better bread than other areas due to varying ingredients. In some parts of France, there was very little wheat or rye available which led to the bread being made from less desirable grains.<sup>88</sup>

The citizens of the occupied European countries received less food than the people living in Germany because the food that was produced on the farms in the occupied countries was confiscated and transported to Germany. The Germans then used this food to feed their citizens and to support the German war effort. This resulted in famines throughout countries in Western and Eastern Europe. In Western Europe, the Netherlands experienced a severe famine towards the end of the war due to the Anglo-American invasion of Europe cutting off supply routes. The Netherlands had some food stockpiled to feed their population, but the majority of food grown in the Netherlands was sent to

Germany. The Red Cross intervened and food was delivered to the Netherlands but not before several thousand people had died from malnutrition.<sup>89</sup>

Eastern Europe also experienced several famines, but this was due to deliberate German policy as part of the Holocaust. When Germany invaded the Soviet Union, they already had plans to take the resources from Eastern Europe and starve the population. One of the goals of the Wehrmacht (German Army) was to seize the rich farmlands in Eastern Europe and use them to produce food for Germany. When planning the invasion, the Germans divided Eastern Europe into two zones, one zone that produced surplus food and one zone that needed food imports. After the Germans took control over these areas, they halted all food imports and began to transport surplus food back to Germany, leaving millions of people to starve. It is believed that over 10 million tons of food was taken from the Soviet Union during the German occupation which resulted in the deaths of 4-7 million civilians.<sup>90</sup>

The Nazis also used food to intentionally starve Soviet POWs and civilian prisoners in concentration camps and work camps. The Nazis wanted their forced laborers to work more efficiently and performed several human experiments to determine the fewest number of calories that were needed to keep a person working. The goal of the Nazis was to maximize productivity while feeding workers the fewest calories and nutrients possible.<sup>91</sup> Many of these prisoners were literally worked to death by the Nazis in an attempt to get as much work as possible out of them even though the prisoners were not fed adequately.

The British and German views of nutrition were similar in several ways because both governments provided additional food and nutrients for children, the sick, and pregnant women. Both countries also benefited from mistakes made during the First World War and did not want them repeated. The British government attempted to provide their entire population with proper nutrition, while the Germans were focused on providing ethnic Germans with the best nutrition at the expense of other ethnicities. The Germans also used food as a weapon of genocide in their attempts to conquer Eastern Europe.

### **Animal Health and Nutrition**

Much like humans, animals also needed to be fed in order for them to produce food or work efficiently. During the Second World War, the British and Germans viewed their farm animals differently because of each country's needs of the farm animals. The British viewed many of their farm animals, who were competing with humans for food, as an unnecessary waste of land and nutrients. The Germans saw their animals as both valuable production animals and important draft animals for the Wehrmacht. Both countries had to decide how to best feed their animals in order to get the maximum efficiency out of their animals in either food production or work.

The United Kingdom slaughtered many farm animals, not just to increase their food production by repurposing fields but also for nutritional reasons. These farm animals were seen as taking vital nutrients away from people that needed them during the war. Before the start of the war, there were more farm animals in the United Kingdom than there were people. These animals included cattle,

poultry, and sheep who consumed more food than humans, and the majority of crops grown or imported went to feed these animals.<sup>92</sup> The British Government decided that using the existing farmland to produce food for humans would be a better use of the available resources. When examining how much animals ate in the United Kingdom, it is easy to understand why the British chose to prioritize food for humans over food for animals. Before the war, three million acres of farmland were devoted to producing human food crops while over twenty-seven million acres were allocated to livestock. When examining the amount of food consumed, it is easy to see that animals ate much more food than humans. It was estimated that the livestock consumed ten times the amount of food that people ate. When examining nutrients, this meant that for every one pound of food going to people, ten pounds of food went to feeding the animals.<sup>93</sup>

In peacetime, the nutrients eaten by the farm animals were then used to feed people using the animal products. This system benefited humans because they were able to eat a higher concentration of fat, protein, vitamins, and minerals from animal products such as eggs, meat, and cheese. The British Government acknowledged that during peacetime, this was a good system because the animals could eat plants that humans could not. However, the enormous amounts of feed needed for these animals made this system inefficient during the war. Before the war, the British farmers focused on producing animal products and relied on importing large amounts of feed from other countries for their animals. Once the Second World War started, this system was no longer sustainable and growing food for people became necessary. When looking at

the calories produced by one acre of land, it is clear why. An acre of potatoes will produce six million calories, but if these potatoes were eaten by a cow and turned into milk, the same acre will only produce three million calories. If the acre of potatoes is turned into beef by a steer, it will produce only two hundred thousand calories.<sup>94</sup>

The German blockade is what caused the British Government to compare the nutritional needs of farm animals and people. Their conclusion was that imported and locally grown food would be better used feeding the human population of the United Kingdom directly instead of being converted into animal products first. Just like the British, the Germans also had to decide if they wanted to use plant-grown nutrients to feed farm animals or people.

One of Germany's main farm animals was swine which produced almost 60% of the meat consumed in Germany. About half the German potato crop went to feeding the swine, with the other half going to feed humans.<sup>95</sup> The potatoes were usually cleaned and cooked before being fed to the swine because it enabled the pigs to grow faster and allowed them to use the nutrients more efficiently.<sup>96</sup> Germany used potatoes instead of corn or wheat to feed the swine because potatoes could easily be produced in Germany and German farmers would not have to rely on imported feed. Throughout the war, German farmers were still able to keep raising swine because the swine could eat foods that other animals cannot.<sup>97</sup>

In the countries of occupied Europe, the situation was different than in Germany, and in many of these countries the farm animals had to be slaughtered

to provide food for humans or to allow more food to be grown for humans. One country that had imported vast amounts of food for animals before the war was the Netherlands. After the German invasion of the Netherlands, these food imports were no longer available so the Dutch Government had to decide whether to feed the farm animals or the people. They decided that farms in the Netherlands should produce food for human consumption for similar reasons that the British came up with in establishing their plan for feeding people. The Dutch began to grow crops that would produce the maximum amount of nutrition for their people.<sup>98</sup>

The Germans did not only have to worry about farm animals but also about the horses and other draft animals used to haul military equipment. The German system of using draft animals had some advantages and disadvantages. The main advantages were that Germany was less reliant on gas and diesel fuel, that pack animals can graze for their food, and that pack animals can travel into areas vehicles can't access. Draft animals also have some disadvantages: if food is not available, it needs to be transported to feed the animals, the animals can only work for a certain amount of time before they get tired, and the animals need proper care and nutrition to maintain their strength. During the Second World War, the Wehrmacht relied heavily on horses to pull artillery and wagons. Before the invasion of France, the Wehrmacht used 52,700 horses and after the conquest of Western Europe, the Germans took horses from these countries to use as draft animals.<sup>99</sup>

The use of horses as draft animals caused many problems because each horse required approximately twenty pounds of food per day which must be provided if grazing is not available. Also, horses are susceptible to numerous diseases that can require special diets to treat.<sup>100</sup> When the Germans invaded the Soviet Union, they encountered many problems with their reliance on horses. One major problem was the health and nutrition of the horses, and the Wehrmacht was required to transport hundreds of tons of food for horses. Also, the horses taken from Western Europe were not accustomed to the climate of Russia and suffered from malnutrition. The winter of 1941-1942 was a desperate time for the entire Wehrmacht because they were not prepared for the winter. Also, they were losing about one thousand horses per day or a total of 180,000 horses during the entire winter. These losses were largely from weather and disease. It was difficult for soldiers to find adequate food and shelter for their horses and vet clinics became swamped with the large numbers of sick animals.<sup>101</sup>

As the war progressed, the use of horses as draft animals began to hamper the Wehrmacht because the horses were slow compared to motor vehicles and the advancing Allied armies moved faster than the retreating Germans. Nazi Germany had a difficult time replacing the horses that were lost to sickness or combat, and there were some cases when Wehrmacht units lost their entire veterinarian staff to combat which made taking care of the horses more difficult.<sup>102</sup> The reliance on horses did not just impact the Wehrmacht but also the civilian farmers in Germany and occupied Europe. The military either



bought or confiscated horses from farmers which resulted in a shortage of farm animals. Since agriculture in these countries was not highly mechanized, the loss of these farm animals had a negative impact on food production which decreased between 20% and 40% throughout Europe.<sup>103</sup>

Both the United Kingdom and Germany treated farm animals similarly, and both countries realized that they needed to direct food and nutrition resources towards humans during the war. In the United Kingdom and Germany, farm animals were slaughtered to reduce the amount of food that they consumed. Unlike the United Kingdom, Germany relied on horses for transportation and for working on farms which meant that the Germans still needed to produce food for these animals. This caused some problems for the Germans because land that could be used to produce food for people had to be used for animals. The decision to redirect nutrients from animals to people was more of a decision based on necessity and wasn't influenced by either country's political system.

### **Plant Health and Nutrition**

Since both the United Kingdom and Germany were concerned with producing as much food as possible for human consumption, both countries wanted to make sure their plants and crops were healthy and had the proper nutrients to grow. The British benefited from a pre-war survey of their land that allowed them to decide which crops to plant on each farm. Another benefit for the United Kingdom was the ecological work of Charles Elton who was concerned with protecting British crops from invasive species.<sup>104</sup> The Germans

benefited from having more land for farms but were not able to produce enough fertilizer to increase production.<sup>105</sup>

Between 1931 and 1933 the British Government conducted a survey of land in the United Kingdom to create maps of how the land was being used. After the Second World War started, the British were able to use these maps to decide where to plant crops to increase productivity. These maps of the farmland also helped the British reclaim the land that was not being used for agriculture and decide what crops to plant on the reclaimed land.<sup>106</sup>

During the Second World War, the British sacrificed plant health and nutrition in order to grow some needed crops such as wheat. In the United Kingdom, there was only a small area that the conditions were favorable to grow wheat, and some wheat had to be grown in areas that were not the best suited for wheat production. Wheat was grown in these substandard areas in order to have enough flour for bread production. In this case, productivity was sacrificed to be able to have enough wheat bread for the population.<sup>107</sup>

Charles Elton was a British ecologist who had founded the Bureau of Animal Population in 1932. The goal of this organization was to study four invasive species that had been introduced to the United Kingdom. These species were the Norway rat, the black rat, the house mouse, and the European rabbit. All four of these species were causing damage to British crops and it would be a major benefit to the United Kingdom if these species could be controlled.<sup>108</sup> Even though the British Government understood that this was

important work, not everyone thought that controlling pests was a good use of resources and some accused Elton of draft dodging.

During the Second World War, Elton made eradicating rats from the United Kingdom his personal mission. He realized the damage rats were doing to the farms, the native plants, and the native animals in the United Kingdom, and he wanted a way to stop them.<sup>109</sup> Elton had several strategies in his fight against the rats, which included traps, poison, and making the environment less favorable to pests.<sup>110</sup> The Second World War was the first time rodents had been studied in the United Kingdom, and Elton and his group of ecologists had a lot to learn about animal behavior and how to properly eradicate rodents. One important lesson was that an infestation would spread to neighboring buildings and fields if it was not contained quickly. Another lesson was that rodent control was an ongoing process and that it was more difficult to control an infestation after it had become firmly established in an area than to prevent an infestation from becoming a problem.<sup>111</sup> The British were also worried about other invasive species coming into the United Kingdom on ships and set up measures to prevent this. The work done by Charles Elton helped the British Government and the general public realize the dangers posed by invasive animals and how to stop invasive species.

The Germans lost some productivity during the war due to a shortage of fertilizer. The factories were not able to produce enough to meet the demand which meant that farms had to use animal manure instead. Manure was not as good as synthetic fertilizer and if the animals it was collected from were not

properly fed, then the manure would be almost useless because it did not contain the proper nutrients. Since many animals were not fed the nutrients that they needed, their manure was not very useful for fertilizer which meant that the crops grown with this fertilizer did not have the required nutrients to continue growing. Also, there were fewer farm animals which led to a decrease in the amount of manure available.<sup>112</sup>

### **Chapter 3 Conclusion**

The Second World War caused the United Kingdom and Germany to respond differently when looking at the health and nutritional needs for humans, animals, and plants. Both countries realized that some groups of people were vulnerable to malnutrition during the war and attempted to provide these groups with adequate nutrition. However, the Germans also used food as an easy way to exterminate certain ethnic groups as part of the Holocaust. This use of food by the Nazis correlated with their plans for Eastern Europe which they wanted to turn into a Germanic state.

Animals were an important part of both countries pre-war agriculture systems. However, when the countries had to decide between providing animals or people with proper food and nutrition, both countries chose to feed their human population over the animal population. This decision was easy to make after considering how much more animals ate than humans and how many calories were lost by animals eating food that could be consumed by humans. In addition to farm animals, the Germans also had to feed draft horses for their

army which caused many problems making sure these animals were fed well enough to work.

The British were better prepared when it came to planting crops because they had already done surveys of the land and knew which crops were best planted in each location. The Germans were hindered by their lack of fertilizer and not knowing how to grow crops on the land that they had conquered. Despite these challenges, both countries attempted to use nutrition to their advantage during the war and used nutrition to help their war effort.

## Conclusion

The Second World War was not just a military struggle but also a struggle between two different agriculture systems and rationing systems. The British system was focused on producing food for the entire population of the United Kingdom and ensuring the entire population's nutritional needs were met. The German system focused on producing food for ethnic Germans at the expense of other groups. The United Kingdom and Germany attempted to provide the best nutrition possible to specific vulnerable groups such as pregnant women, sick persons, and children. When examining the two systems, the British system was more successful because it allowed the population of the United Kingdom to be fed throughout the entire war with very few negative consequences.

The British planned out which farms they would use to produce each crop and this allowed the crops to grow better because they were planted in the areas with the best growing conditions. British farms were also highly mechanized which allowed the farmers to plant and harvest crops faster. The British had to manage their farms more efficiently than the Germans because the United Kingdom is composed of islands and they only had a limited area of land that they could use for agriculture.

Even though the Germans controlled more land in Europe during the Second World War, they did not use it as efficiently. The German farms were not as highly mechanized as the British farms which led to a decrease in food production. To make matters worse, the Germans confiscated thousands of horses from European countries for their military which decreased productivity

further because there were fewer horses to work on the farms. Germany and the areas of German occupied Europe suffered a famine at the end of the war due to a lack of food and difficulties in transporting food. In the United Kingdom, there were several occasions that food rations were short, but there was never a massive famine.

The United Kingdom and Germany both used women, POWs, and foreigners as farm labor to replace the men that had been drafted into the military. The British had previous experience from the First World War using women as farm laborers and were able to use this knowledge to their advantage during the Second World War. At the start of the war, the British Government knew that women would need to be trained in agriculture to help produce food. The German plan to have women work on farms had more of a political goal and was not very effective. The German women received very little formal training and there was not a major effort by the Nazi Party to recruit more women in order to increase food production.

Both the United Kingdom's and Germany's rationing systems were effective except that at the end of the war, the German system began to break down due to the military situation. Under the British system, the majority of the population was well fed for the entire war and the food rationing helped the British last through the German U-Boat blockade. The German food rationing system resulted in the deaths of millions of people either due to starvation or disease from malnutrition. The reason for these deaths was the Nazi racial hierarchy which resulted in the Nazis valuing ethnic Germans over all other

ethnicities. In many cases, these deaths were intentional as part of the Holocaust and were part of the Nazi eugenics policy.

The United Kingdom relied on nutritional science when deciding whether or not to keep their farm animals fed during the war. The British concluded that feeding these animals would take too many valuable resources away from people which resulted in many animals being slaughtered. It was more efficient to have people eat the calories and nutrients directly from the crops that were grown instead of converting the plants into animal products such as milk, meat, or cheese. The Germans kept many of their farm animals around because it was still efficient to feed them and then have humans eat the meat. The Germans also used draft animals for farming and military transport. Since these animals needed proper nutrition to continue to work, the Germans were forced to care for these animals in order to support their farmers and the military. In the occupied European countries, the German controlled governments agreed with the British decision and realized that raising animals would waste resources and they focused instead on growing crops for human consumption.

The British had more advantages in the area of plant health because they attempted to stop invasive species from damaging their farms. The British used the ecological work done by Charles Elton in an attempt to reach their goal of stopping invasive species. The Germans actually made it more difficult to grow crops on the farms that they took over in Eastern Europe because they evicted the farmers that knew the area and replaced them with German farmers.



The differences between the two rationing systems can be clearly seen when examining the Channel Islands. After the war, there was a study done to compare the growth rates of schoolchildren who had lived through the German occupation of the Channel Islands with schoolchildren who had been in the United Kingdom during the Second World War. Factors such as weight and height were measured and this study concluded that the children who had been in the United Kingdom had received superior nutrition throughout the war. These factors (weight and height) were chosen because they are directly influenced by nutrition.<sup>113</sup>

During the Second World War, both the United Kingdom and Nazi Germany used agriculture to feed their military and civilian populations throughout the war. This part of the war was not a traditional battlefield but still had a significant impact on the war. Germany did not manage their agriculture production well and suffered from food shortages towards the end of the war, whereas the United Kingdom managed their agriculture well and was able to prevent starvation as a consequence of the German blockade. Despite what some people believe, the examples from the United Kingdom and Nazi Germany demonstrate that agriculture, nutrition, and food distribution can have a significant impact on war.

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