INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS IN THE 1940s

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Introduction

'Following the rupture produced by the Second World War, world agricultural trade adopted other patterns…..(Aparicio et al, 2009: 69). The old pattern of trade had involved the exchange of European manufactured products for primary products from the new world and the European colonies. In the new one, the emphasis was much more on trade between developed countries. What brought about this change? To some extent it must have been affected by the post-war decline of European colonialism and the rise of import substitution agriculture, but to what extent was it directly attributable to the war itself? And if the war had some impact on agricultural trade, what impact did agricultural trade have on the war? Unfortunately the historical literature provides no clear answer to these questions. There are studies of agricultural trade that cover the pre-war and post-war periods but not the war itself (Tracy, 1982; Friedmann and McMichael, 1989; Federico, 2005; Aparicio et al, 2009), and other recent works that cover the war but say little about agricultural trade (Overy, 1996; Gildea et al, 2006; Mazower, 2009). The nearest in scope to the present study are older works such as those of Brandt and his associates (1953), which is only concerned with continental Europe, and Milward (1987). There are also numerous studies of individual countries, but they are not directly concerned with the international aspects of agricultural trade.

The aim of the present paper is therefore to examine international trade in agricultural products in the period that Aparicio et al (2009) omit from their study: the years of the Second World War itself and those immediately following it. The data examined are extracted from the publications of the International Institute of Agriculture and its successor organisation, the Food and Agriculture Organisation of the United Nations, and a significant part of the paper is therefore concerned with assessing their accuracy and value. It also examines the particular agricultural trade problems faced by the two sides in the conflict, and the impact of the war on the trade

of the countries that remained neutral. Finally it briefly summarises the important developments of the post-war years. To begin with, however, it is necessary to put the wartime trade problems in perspective by briefly examining the starting point: in other words, the problems of international trade between the wars.

Interwar agricultural trade, and especially the way in which it evolved in the 1930s, provides a classic example of beggar-my-neighbour policies making a difficult situation worse. Increasing output met static demand, and, coupled with a variety of tariff and non-tariff barriers to trade, produced fluctuating prices and, in the worst years of the early 1930s, decreasing volumes of trade. Exports from the USA especially were significantly reduced (Tracy, 1982; Federico, 2005; Hehn, 2005). Table A1 (tables in the statistical appendix are printed at the end of this paper) reveals the basic pattern of trade. Wheat and coarse grains were, in quantity terms, the major traded products, and the UK was the dominant importer, although several countries that were destined to be occupied by Germany during the war, and are therefore referred to as 'occupied importers' were jointly the next most significant importers. The principal exporters served different markets, in that those with British connections sold to western Europe, while the south-eastern European exporters concentrated on the German and associated (i.e. Austrian and Czech) markets. At the beginning of the war the United Kingdom was therefore import-dependent as far as food was concerned, recognized the fact, but seems to have been confident that its naval power would ensure the continued arrival of food imports. As Wark (1986: 152) argues, this was probably the result of faulty naval intelligence. Germany, on the other hand, was much less import-dependent, but, paradoxically, much less confident of its ability to find wartime food supplies. The effect of memories of the First World War can perhaps be detected in the attitudes of both countries (see Offer, 1989). To a surprising degree, these predictions turned out to be basically accurate.

Agricultural trade during the war

Tables A2 to A9 (IIA, 1947: passim) show how trade in the main temperate commodities varied during the war. Overall, and unsurprisingly, the war brought about a decrease in the volume of trade, but the extent to which individual commodities were affected varied. European imports of the bread grains, wheat and

rye (tables A2 and A3), decreased by more than a half between 1939 and 1944, and European exports fell in proportion, although the extent to which new world exports fell was variable, especially in the case of wheat. European imports of coarse grains (table 4) had been of the same magnitude as those of wheat before the war, but they fell to a much greater extent, from over 8 million tons per year in 1939 to less than half a million in 1944. Similarly butter imports fell significantly (table A7), and the egg trade (table A9) virtually disappeared over much of Europe, but the beef and pig trades overall (tables A5 and A6) were less affected, and the cheese trade totals (table A8) changed very little. The UK continued to be the dominant importer in many commodities, as it had been before the war, and the general level of import prices roughly doubled between 1939 and 1945 (Murray, 1955: 20). However, these overall totals hide some very significant changes as far as individual countries and commodities were concerned.

In tables A2 to A5, and A8, the importing countries are listed as the UK, Austria-Germany, Italy and France, which are self-evident, and the 'occupied importers', which include Belgium, Luxemburg, the Netherlands, Greece, Denmark, Norway, and, where appropriate, Czechoslovakia and Finland (which obviously was not occupied in the same way as the others but is included here because it faced the same import restrictions). Spain and Portugal are distinguished from the other neutral countries (Ireland, Sweden and Switzerland) because, as will be seen below, they were treated differently by the Allies. The exporting countries of western Europe were sometimes the same as the importers, because of the complexities of the various trades, and as well as Denmark, the Netherlands and Ireland, the principal exporters, they also included France and Italy. The eastern European exporters were Hungary, Bulgaria, Romania, and, for some commodities, Yugoslavia. Poland was a significant exporter before the war but all recorded exports from there ceased after 1939. The new world exporters – Canada, the USA, Argentina, Australia and New Zealand - are self-explanatory. In the other tables there were fewer significant exporters and importers, so countries are listed individually. In all cases only the more significant traders are counted, with those countries exporting only a few hundred tons of any commodity being omitted. In each table, therefore, a dash (-) in a cell indicates a figure of less than a thousand tons.

In terms of tonnage, if not necessarily in value, wheat continued to be the most extensively traded commodity in the war, as it had been in peacetime. The UK continued to import at or above peacetime levels until 1942, and even in the latter years of the war it was still regularly importing around four million tons or more. In contrast, Germany and Italy did not manage to maintain pre-war import levels, and neither did France , the other European importers, or the neutral countries, with the exception of Spain and Portugal. France and Italy were in a slightly curious position, because they were exporters as well as importers. The eastern European exporters, Bulgaria, Romania and Hungary, initially managed to increase their exports, almost all of which went to Germany, but by 1940 they were falling and from 1942 onwards they were at only one tenth of their pre-war level. The new world exporters, on the other hand, generally maintained their basic levels of trade, albeit with some falling off in 1941 and '42. Overall, and mainly due to these latter countries, wheat exports comfortably exceeded European imports during the war, with the surplus presumably accounted for by the intra-American or Pacific trades. Trade in the other bread grain, rye, was largely intra-European, with Germany as the main west European exporter, re-exporting to occupied rye-consuming countries such as Norway and Finland. The main pre-war east European exporter, Poland, ceased to record any exports after 1939, presumably because it was by then effectively part of Germany.

The trade most affected by the war was that in coarse grains (i.e. barley, oats and maize – see table A4). Most of these were used for animal feedstuffs, although some barley was probably used for malting purposes. By 1939 European imports of coarse grains were lower, at about 8 million tons, than they had been in the previous 5 years, when they averaged over 11 million tons, and subsequently they decreased rapidly, accounting for less than half a million tons by 1944. Clearly, faced with transport and acquisition problems, all importers chose to prioritise human over animal food, and countries such as Denmark, Belgium, the Netherlands, together with the UK and Germany, all of which had been maize importers on a considerable scale before the war, thus found their ability to produce meat and dairy products seriously affected. Bulgaria, Romania, Hungary and Yugoslavia had together exported over a million tons of maize in the late 1930s, most of it to Germany, and the expectation must have been that this trade, which was virtually impossible to blockade, would have continued in the war, but in practice it declined rapidly, and by 1941 the east

European countries were exporting less than 200,000 tons of coarse grains in total. The western hemisphere exporters, especially Argentina, which had been a major supplier of maize to the European market, were obviously affected by these changes, although Canada perhaps least so, because in 1943 and '44 its exports of oats and barley, which increased enormously, were matched by an increase in imports by the USA, especially of oats, presumably for horse feed.

The UK and Germany were the major European meat importers, both of live animals and carcase meat. As far as live animals were concerned, the UK import figures for fat cattle matched the Irish export figures almost exactly throughout the war, whereas the German import figures, which equated roughly to the combined export totals of Denmark and Hungary in 1939 and 1940, considerably exceeded them between 1941 and 1943 as Germany extracted fat cattle from the other occupied countries (IIA, 1947: 440). Most of the pre-war UK beef supply came in the form of chilled, frozen or canned meat from Argentina, and to a lesser extent, Australia. Imports of chilled beef ceased after 1939, but frozen and canned beef imports were increased, so that the overall total of imports decreased only a little. The main beneficiary of this was Argentina, which maintained beef exports virtually at pre-war levels until 1944. Australian exports, faced with the longer sea journey, fell by more than a half (see table 5). Pigmeat, too, was traded in several different forms (table 6). The main pre-war importers of live pigs were Germany and Czechoslovakia, across the land frontiers from Denmark, Poland, and south-eastern Europe, but by 1941 only Denmark and Germany remained as significant trading partners. In the pork carcase trade the UK was the predominant importer, and its imports, especially of frozen and canned pigmeat, increased during the war. Spain, Finland, Hungary, Ireland, Italy, the Baltic states, Poland and Yugoslavia also exported pigmeat before the war, but by 1942 all had ceased to export any significant quantity. Where the UK's canned pigmeat came from remains mysterious, because although exports from the USA rose in 1942, but not by as much as UK imports, and exports from Argentina, the obvious candidate to make up the deficit, certainly rose in 1942-4 but were recorded as frozen pork rather than canned pigmeat. Before the war the UK appears to have been almost a monopsonist in the bacon market, and with Polish, Danish and Dutch exports cut off after 1940, and Irish production affected by the decline in coarse grain imports, it was the USA, and especially Canada, that took over as the major bacon exporters to the

UK, and wartime import levels were not far below those of peacetime. Cheese imports by the UK were also maintained at or even above peacetime levels (table 8) through the maintenance of New Zealand exports and the entry of the USA into the export market, whereas UK butter imports (table A7)decreased and egg imports (table A9) virtually disappeared. Germany was successful in maintaining or increasing imports of all these dairy products at or above pre-war levels until about 1942, but thereafter its imports fell away rapidly.

It is important to recognize that the figures for wartime years given in the tables quoted above may not be precisely accurate. They were collected by the Institut International D'Agriculture, the forerunner of the UN Food and Agriculture Organisation, which was based in Rome. It was run by a General Assembly, which met for the last time before the war in 1938, and a Permanent Committee, which met thirteen times between then and 1943. After that it became too difficult for delegates to get to Rome. Nevertheless the Institute retained its autonomy and continued to collect data and publish reports up to the autumn of 1943, although its regular production of trade statistics was clearly interrupted by the war, and by the increase in printing costs, which rose by fifteen times between 1939 and 1945 (IIA, 1945: 9-11, 44, 71). When the wartime trade data were eventually published, in 1947, the foreword contained a note to the effect that all the figures were potentially unreliable, and German occupation meant that some countries, such as Poland and Austria, effectively ceased to exist as separate reporting units (IIA, 1947). The IIA figures can be checked, to some extent, with those produced by other sources. They agree with Mitchell (1978) but that is not surprising because he appears to be using them as his original data source. Part of the problem is that other sources may use harvest years as opposed to calendar years, or different specifications of commodities (e.g. all meat as opposed to beef and pigmeat). However, it is possible to make some valid comparisons. For example, it would be expected that most Danish exports between 1941 and 1944 went to Germany, so comparing the IIA figures for all Danish exports of a commodity with Brandt's (1953) figures for Danish exports to Germany and deliveries to the Wehrmacht in Denmark should produce roughly similar figures, and generally they do, as table 1 (next page) indicates.

Table 1: Danish exports of animal products to Germany 1941-44 (‘000 tons)

	1941	1942	1943	1944
IIA pork and bacon	90	32	67	117
Brandt pork and bacon	82	28	70	112
IIA beef and veal	64	33	15	34
Brandt beef and veal	65	38	19	39
IIA eggs	33	6	2	3
Brandt eggs	24	6	2	3
IIA butter	53	36	50	53
Brandt butter	54	29	45	46
Nissen butter	55	35	50	55

The figures in the bottom line of table 1 are from Mogens Nissen’s data, derived from Danish national sources (Nissen, 2004: 192). The figures in table 1 suggest that the IIA data are at least of the correct order of magnitude, and so does a comparison of the IIA figures for maize imports into the UK with similar figures in Murray (1955: 385). Figures for butter and cheese imports into the UK agree with those derived from the UK Board of Trade *Annual Statements of Trade* and reported in Medlicott (1954:392). Similarly, Brandt (p.611) shows Hungarian bread grain exports to Germany varying between120,000 and 190,000 tons from 1941 to 1944, while the corresponding IIA figure is 130,000 to 220,000 tons. However, the IIA figures for Eastern European feed grains exports appear to be greater than those given by Brandt (p.611), the IIA fails to pick up exports from occupied Russian territories to Germany, and the IIA figures for exports of French cheese to Germany in 1941-2 are at about half of the level of Brandt’s (p.564) figures for exports to Germany and deliveries to the Wehrmacht in France. There are also inconsistencies in the figures for grain imports into Germany. Brandt (1953: 610) and Kroener et al (2000: 469-70), both

working from German sources, differ slightly from each other on the level of grain production and trade, especially for the latter years of the war. As far as meat and fat imports into Germany are concerned, they are virtually in agreement. But although the IIA figures for German grain imports are of the same order of magnitude ad those of Brandt and Kroener et al for the pre-war years and 1939, they begin to differ from 1940, and thereafter are significantly different: whereas Brandt and Kroener et al show imports rising, from over 2 million tons in 1939 to between 5 and 6 million tons in 1942-4, IIA figures show them falling, from over 2 million tons in 1939 to only 1 to 1.5 million tons in 1942-3. Similarly, while IIA figures show total meat imports being maintained at their 1939 level until 1944, Brandt shows higher total figures and a different (i.e.increasing) trend until 1943. On the other hand, it is worth noting that Milward's figures, expressed in monetary terms at constant prices, suggest that net imports of all foodstuffs into Germany almost halved between 1939 and 1943 (Milward, 1987: 262). Overall, therefore, it seems fair to conclude that the figures in tables A2 – A9 are a reasonable guide to the basic pattern of agricultural trade, but that figures for Germany need to be treated with great caution.

The main features of wartime international agricultural trade that need to be explained, to judge from these figures, are the maintenance of UK imports, or at least some of them, the changes in German imports, and the changes in the production and trade of the major exporters. The main problems for the UK were to acquire supplies, find the foreign exchange to pay for them and the shipping to move them, to get the ships safely to port, and to move the food from the ports to the consumers. For Germany the problems were similar, except that much of Germany's imports came via overland or inland water rather than seaborne transport. For the exporters, the main task was to adjust their patterns of trade to the new wartime circumstances. Each of these will be discussed in turn.

Wartime trade from a British perspective

The British government established the Food (Defence Plans) department of the Board of Trade in November 1936 (it became the Ministry of Food on the outbreak of war), to operate in concert with the food industry. While it was initially reluctant to interfere with normal trade, growing concerns over the international situation led to the government instituting a series of negotiations with its main

trading partners with a view to securing supplies in the event of war. By June 1937 agreements had been made with the main Dominion suppliers for the British government to take control of their exports on the outbreak of war. Over the following year further talks were held with representatives of the UK's European trading partners, together with Argentina, and in November 1938 an Anglo-American trade agreement was signed (Wilt, 2001: 86-100). Ministry of Food plans at the beginning of the war assumed that it would be possible to import only 15 million tons of food per year, in contrast to the pre-war total of over 22 million tons. In the event, food imports after 1942 averaged nearer 11 million tons (Hammond, 1951: 65).

The first problem was to acquire this food. It is clear from table A1 that before the war Britain imported significant amounts of food from Denmark and the Netherlands, both of which were neutral states at the beginning of the war, and anxious to maintain their trade with both belligerents. By the spring of 1940, however, all continental supplies were cut off and Britain was forced to rely on non-European suppliers. In the case of sugar, for example, the wartime policy was to buy all available sugar from empire sources at a price of £3 – 15s. per ton, which was soon below the world price. There were problems with these suppliers, caused by droughts in Natal in 1943 and cyclones in Mauritius in 1944, whereas supplies from Cuba and the Dominican republic were maintained at or even above their pre-war level (Chalmin, 1990: 221-3; Hammond, 1951: 395). The UK government bought the whole of the Australian wool clip from the beginning of the war, and there were similar contracts with South Africa and New Zealand, to put the UK in the position of a monopoly buyer and to deny wool supplies to the enemy. The UK also made contracts to buy surplus Australian meat, dairy produce, eggs, and dried and canned fruit, and similarly the New Zealand government Primary Products Marketing Department bought all meat and sold it to the UK government (Butlin, 1955: 60; Davidson, 1981: 326; Crawford et al, 1954: 284). The process was complicated by the existence of international trade agreements, which were a hangover from the pre-war problems of international food trade. Importers wished to be assured of supplies, and exporters of markets, so often exporters agreed to quotas in order to divide up the market. Thus Australia was guaranteed an export quota of 400,000 tons under the terms of the International Sugar Agreement, which expired early in the war. Unfortunately shipping problems meant that its exports were restricted to 66,000 tons

by 1942-3. Similarly, it also had a wheat export quota under the terms of the International Wheat Agreement, talks on which had lapsed at the beginning of the war and resumed in May 1941 on the initiative of the USA (Butlin, 1955: 84; Butlin and Schedvin, 1977: 205).

The main wartime exporters to the UK of cereals and meat were Canada, the USA, and Argentina. As exporters, before the war the main problem they faced was a lack of demand caused by the depression; during the war this was replaced by the U-Boat problem and shipping shortages, and shortages of foreign exchange in their principal market, the UK. Nevertheless, Canada increased its wheat exports to the UK from a little over two million tons before the war to 3 million tons in 1944, Argentina increased its meat exports, and the USA and Canada also became significant meat suppliers to the UK (Hammond, 1951: 395). As the British economy turned to war production its manufactured exports inevitably fell, and consequently so did its ability to pay for food imports. Australia was willing to accept payment in sterling, which made it an attractive supplier, especially given the level of sterling assets held there (Butlin, 1955: 58). Canada solved the problem simply by generosity. In total, Canadian exports to the UK (i.e. not just of food) doubled between 1939 and 1942, and almost doubled again by 1944, and much of this trade was financed by loans and outright gifts, involving over $3,500 million between 1942 and 1945 (Norrie and Owram, 1991:520-521; Hancock and Gowing, 1949: 375). The USA did it by the Lend-Lease programme, which began in March 1941 and by August 1945 had provided goods to the value of over $30 billion, of which $27,025 million went to the UK. Lend-Lease to the British Empire accounted for 11 per cent of the USA's war expenditure (Hancock and Gowing, 1949: 374-6). In Hammond's view, Canadian food exports enable Britain to survive, while the USA's contribution gave its food consumers a more varied and nutritious diet (Hammond, 1951: 231). Canadian and American trade with Britain was managed, in the latter part of the war, by the Combined Food Board, which was established on 9 June 1942 as a UK/USA committee. It involved the Canadians almost from the beginning (they became official members in October 1943), and later included the USSR on the tea committee, Newfoundland on the fish committee, and, after their liberation, many continental European countries. Thus by the middle of the war much international trade was subject to combined planning, and the basic planning structure that would be used for

the rest of the war was in place, and already dealing with sugar, canned meat, oils, and fats (Roll, 1956: vii, 47, 82).

All this might suggest that the wartime transatlantic food trade was a matter of calm consideration, equitable allocation of scarce resources, and harmonious and fruitful co-operation, but that would be a misconception. There were many arguments, both tactical and strategic, over stock levels and shipping space (Smith, 1996: 194-202). For the UK, there were several immediate problems on the outbreak of war: a shortage of shipping, which was likely to be increased by enemy action, increased freight rates, and the fact that two of its main suppliers, Australia and New Zealand, were on the far side of the world. Later in the war there was the additional complication that food and raw materials had to compete for shipping space with military personnel and hardware. Being dependent upon foreign suppliers for two-thirds of its food supplies, Britain's annual requirement for shipping space was about 23 million tons. Some of this was available from the UK merchant fleet, which had, for example, 853 refrigerated ships available for transporting meat and dairy products, but significant amounts of shipping were chartered from other countries. From 1939 Norwegian and Greek shipowners were increasingly unwilling to allow their ships to sail into British ports which might be mined, and it rapidly became clear that it was much more effective to use a ship on the relatively short journey across the Atlantic than to send it to Australia. In the same time, 1.5 times as much tonnage could be shipped from Argentina as from Australia or New Zealand; for the North Atlantic the figure was 2.6 times (Milward, 1987: 246; Oddy, 2007; Hammond, 1951: 69; Roll, 1956: 130). Roll (1956: 10) argues that for much of the war the availability of shipping was the 'decisive factor', and Smith (1996: 147, 176) shows that there was a clear conflict between the need to import food and raw materials on the one hand, and military needs on the other. An operation such as the Anglo-American landing in North Africa (TORCH) in November 1942 required considerable quantities of shipping (one estimate was 18 extra ships each month for purely military use), and Roberts (2009: 91-3 and passim) argues that the availability of shipping was the crucial factor in deciding when continental Europe could be invaded. Equally, the UK Ministry of Agriculture had to plan to maximise domestic output in the 1943 harvest in order to minimise food shipping requirements in preparation for the Allied invasion of Europe in the Spring of 1944 (Whetham, 1952: 95).

The food import problem that has attracted most attention is the Battle of the Atlantic. In Churchill's much-quoted phrase, 'The U-boat attack was our worst evil. It would have been well for the Germans to stake all upon it' (Churchill, 1951: 110). This was not what was expected at the beginning of the war, when it was thought that surface raiders would be the big difficulty, while anti-submarine detection equipment (ASDIC) would nullify the U-boat threat (Wilt, 2001: 193). Initially German surface ships did have some successes, but by 1945 only 101 Allied ships had been sunk by surface vessels, whereas 200 had been sunk by U-boats by March 1940. The expectations of ASDIC turned out to be excessively optimistic.[1] By 1942 losses rose to 7.1 million tons of shipping, of which U-boats sank 6.1 million tons, mostly in the North Atlantic, but thereafter sinkings began to decline as the Allies deployed more effective aircraft and escort vessels. In addition, the rate of Allied shipbuilding increased, to an additional 14 million tons in 1943. By June 1943 the peak of the Battle of the Atlantic was over, and by October 1943 the Royal Navy felt so confident about its ability to defeat the U-boats that it cancelled most of its escort vessel building programme. Even at the end of the war, however, the submarine threat was still tying down 400 anti-submarine ships and 800 aircraft. Nevertheless, even Admiral Dönitz, the German U-boat commander, though that 800,000 tons per month needed to be sunk to 'achieve decisive results', and his U-boats never managed to reach that figure (Milner, 2003: 22-4, 80-85, 104, 155, 179).

The final problem for the UK was to get imported food from the ports to the consumers. Before the war cereals had mainly been unloaded at the west coast ports, whereas meat was more likely to be unloaded and stored in London. Similarly, imports from the continent mainly used east coast ports. The effects of air raids and attacks on coastal shipping on the east coast and the in English Channel meant that this pattern had to be changed radically. The result was considerable congestion and confusion. Dock workers had to be moved, inland transport had to be reorganised,

[1] There were two major problems. The first was that many attacks were made by surfaced U-boats at night, in which case ASDIC (i.e.sonar) was useless and radar, which was only available on escort vessels later in the war, was needed. The second was that the normal range of ASDIC was 2300 metres (2800 metres in ideal conditions), whereas the range of German torpedoes was up to 6000 metres, although they were most accurate at about 1100 metres (Lavery, 2008: 304; Dear, 1995: 1120).

archaic working systems had to be changed, and it took two or three years before ship turn-round times could be improved (Wilt, 2001: 197; Smith, 1996: 48-63)

Overall, therefore, as a result of a shortage of foreign exchange, and of merchant shipping, increased freight rates, the difficulties of chartering merchant ships, German naval activity, and unloading and distribution problems, UK import trade was reduced from its pre-war level, as the table 2 demonstrates

Table 2: Food and other wartime imports to the UK

	Total non-tanker Imports (million tons)	Ministry of Food imports (million tons)
1939-40	44.2	20.7
1940-41	31.6	14.4
1941-42	26.9	12.7
1942-43	23.5	10.2
1943-44	26.8	11.5
1944-45	26.0	11.6

Source: Murray, 1955: 152

There are two ways to interpret these figures. One view is that they indicate the success of enemy blockading activity, since the overall level of imports, both of food and other items, was roughly halved from its pre-war figure. Alternatively, they could be seen as evidence of successful adaptation to wartime conditions, in that the proportion of food in the total import figure changed hardly at all, implying that the essential demand for food imports did not prevent the import of industrial raw materials and military supplies. This latter view is only tenable, however, if it can be demonstrated that the decrease in food imports did not result in a worsening of UK diets. There has been much historical work on this topic, and the overall consensus seems to be that wartime diets were different from those of peacetime, but not necessarily nutritionally inferior, as table 3, derived from contemporary figures, suggests:

Table 3: UK supplies, per head per day

	Pre-war	1943	% change pre-war/1943
Calories	2948	2827	-5
Protein – animal (gms)	43	40	-7
Protein – plant (gms)	38	47	+23
Fat (gms)	130	113	-13
Carbohydrate (gms)	373	366	-2

Source: Combined Food Board, 1944: 16

The Combined Food Board figures also show that dietary calcium and iron levels were increased, vitamin A was maintained, and vitamins C, B1, riboflavin and niacin were all increased. In part, therefore, as a result of consumers changing their diets, in part through increased domestic food production, and in part through the maintenance of food imports, people in Britain continued to be able to find enough to eat during the war. Could the same be said of Germany?

Wartime trade problems in Germany

For Germany, the equivalent of the U-Boat campaign was the blockade imposed by the allies. The idea of a naval blockade was not new in 1939. It was an idea that had emerged (in modern times in the UK) between 1903 and 1908. Nevertheless, it was recognized even then that there were potential conflicts with maritime law, especially over whether food for civilians could be regarded as contraband. The eventual reality, though, was that both sides in the First World War attempted to impose blockades, the UK through surface vessels and Germany by using submarines (Offer, 1989: 229-32, 270-72, 354-55). Their re-imposition in a subsequent conflict was perfectly predictable.

The UK's Ministry of Economic Warfare (MEW) came into being on the outbreak of war, with the aim of extending the blockade practices of the First World War, while avoiding their more controversial implications. France had a similar Ministère de Blocus. The success of any blockade of Germany depended on the extent to which it was dependent upon foreign supplies, the UK's possession of the military or diplomatic means to cut them off, and the acquiescence of neutral countries involved in producing them. Within the UK government this led to conflicts between the Board of Trade's desire to maximise foreign trade in order to maintain

foreign exchange earnings, and the MEW's desire to stop all neutral trade with the enemy. Pre-war plans had distinguished between overseas neutrals, who could be put under greater diplomatic pressure because their trade could be intercepted at sea, and adjacent neutrals, who, if pressed too hard, would either ally themselves with the enemy or be attacked by him. Two instruments were used: *navicerts* were commercial passports that could be issued to traders by British missions overseas, and war trade agreements were diplomatic means of preventing the re-export to Germany of goods that had passed through Allied controls. The latter were generally unsuccessful. Agreements were signed with Belgium and Sweden in December 1939, but negotiations with Norway, Denmark, the Netherlands and Switzerland were only completed just before the German invasions. Denmark's negotiating position was weakened by its reliance on sterling balances to buy feedstuffs and oil. Most of its oilseed imports for animal feedstuffs came from UK sources, through entrepot trade from West Africa and the Far East. Equally, the Allied negotiators had to recognize that it was vulnerable to invasion and U-Boat attacks. Similarly, talks with the Benelux countries and Switzerland were complicated both by their possession of land frontiers with Germany and by differences in view between the British and French diplomats involved. Overall, therefore, by 1940, the likelihood of blockading Germany to defeat was not great, although there was a possibility of creating shortages of some tropical products such as cocoa and coffee. Whereas before the war the British estimated that Germany would be able to maintain food supplies for about 18 months, the German military successes of 1940 changed the calculations completely (Medlicott, 1952: 18-19, 26-27, 54-55, 133, 164).

From a German perspective, however, the position looked different. Although a blockade was entirely predictable, and pre-war agricultural policy had been designed to maximise domestic self-sufficiency, imports from south-eastern Europe were still important, and had to be paid for, thus increasing the pressure on an over-stretched economy. Moreover, although Nazi management of wartime food supplies was more successful than that of the German government in the First World War, and ration scales were relatively generous (some poor families were even allocated more than they cold afford to buy) the memories of food shortages in the earlier conflict were still powerful, and led to popular sensitivity to small changes in food supplies, and consequent complaints (Kroener et al, 2000: 453, 464). In October 1939 Göring

was reported as saying that the food situation was 'very grave' as a result of the Allied blockade, and Herbert Backe wanted more imports from Eastern Europe. Kroener et al (2000: 471-2) argue that food supply policy thus '…became a spur to expansion and the exploitation of foreign territory.' It was the thinking behind the exploitation of Polish agriculture and the importation of foreign workers for German farms. It was also the reason, they claim, for the underfeeding of Jews and those in concentration camps, and the euthanasia of handicapped Germans. All were seen as 'useless mouths'. A year or so later, by the spring of 1941, the arguments were strengthened. Agricultural production problems increased in Germany as men and horses were transferred to the military, fertilizers were in short supply, and transport problems promised difficulties in bringing in the harvest. Food stocks which had been planned to last for three years had been used up, and Backe was supporting Hitler's view that the solution lay in the invasion of the Ukraine (Kroener et al, 2000: 673-5, 1096). Tooze, similarly, argues that raw material shortages, of oil, coal and food, were behind the German decision to invade the USSR (Tooze, 2007: 418-25).

Whether or not these arguments are supportable is beyond the scope of this paper. But they are relevant to its central concerns: agricultural trade and the changes produced by or during the war. By the summer of 1940 Germany had gained control of France, the Netherlands and Denmark, three major agricultural producers and exporters, whose output could now be diverted to its own purposes. Why, therefore, can Tooze (2007: 419) claim that Europe was facing an agricultural crisis?

Tooze argues, using figures from Lewis (1941), that western European 'grain' imports, mainly from Canada and Argentina, had amounted to over 7 million tons per year in the immediate pre-war years. Whether or not this agrees with the figures in table 1 depends upon the definition of 'grain'. France and the occupied importers together imported 3.5 million tons of wheat and 4 million tons of coarse grains, so adding both together produces a figure more or less in agreement with Tooze's. However, he argues that this grain was used for animal feed, which is certainly true in the case of coarse grains, but not necessarily so in the case of wheat, part of which at least was used for bread. Nevertheless, his point is a good one, for, as table 4 shows, coarse grain imports into France and the occupied importers fell significantly over the course of the war. Already by 1939 it was down to about 3 million tons, and only half

that level in 1940. That would have been the last year in which imports were available from across the Atlantic, so it is not surprising to find (see table 4) that in the remaining years of the war the figure never rose above 200,000 tons, and in 1944 was down to 44,000 tons. And, of course, these imports would have had to have come from within Europe. Thus the ability of the major western European producers to supply the German market, especially with animal products, should have been considerably reduced.

As the earlier discussion demonstrates [see above after table 1], there are differing estimates of German food production and trade, although it seems fair to say that production fell only a little until the last year or so of the war, imports probably rose, again until the last year or so, and food supplies fell only a little until 1944, although it should be remembered that the population that had to be fed increased as a result of the importation of foreign workers. By 1944, every third armaments worker was a foreigner (Tooze, 2007:640). One estimate of the daily calorie allowance shows it decreasing from 2435 in 1939/40 to 1981 in 1943/4 (Kroner et al, 2000: 674). The basic assumption of German policy was that occupied countries should both feed the occupying Wehrmacht forces and export surpluses to Germany. By the spring of 1941, for example, France had exported 480,000 tons of wheat to Germany, but had also delivered 610,000 tons of wheat to the occupying forces within France (Kroener et al, 2000: 276-7). Again, there are variations between the different sources on the precise figures. IIA figures show total French wheat exports varying between 300,000 tons and 470,000 tons from 1940-43, but with virtually no exports in 1941. A post-war French study estimated the tonnage exported to the Germans between 1940 and 1944 at between 420,000 and 665,000 tons per year, and Brandt's estimates were of the same order of magnitude (460,000 to 686,000 tons) but not identical (Cépède, 1961: 356; Brandt, 1953: 564). It is probably pointless, therefore, to try to produce an accurate and comprehensive estimate of wartime trade with Germany from all occupied countries. The best that can be done is to identify the major trends. As far as France is concerned, Brandt and Cépède's figures suggest gradually increasing quantities of the major products, such as wheat, feed grains, meat, and butter, although fruit and vegetable exports did not increase much, and straw exports decreased. Against a background of decreasing overall French agricultural production, it is not difficult to see why these shipments produced increasing resentment on the

part of the French (Brandt, 1953: 564). Similarly for the Netherlands, the IIA figures suggest decreasing exports of butter to Germany after 1941, with which Brandt (1953: 421) agrees, and decreasing although still significant meat exports. Feed grains, potatoes and sugar exports were all increased, and perhaps the most remarkable feature of Dutch trade with Germany was the maintenance of the traditional trade in flower bulbs and seeds, which were exported not only to Germany but also to other countries in occupied Europe (Brandt, 1953: 422). The other principal exporter to Germany was Denmark, and, as Nissen has demonstrated, Danish-German trade relationships were completely different from those with other occupied countries. Rather than export requirements being imposed, they were a matter of negotiation, and as a result Danish exports, especially of butter and pigmeat, were maintained throughout the war (Nissen, 2006).

Belgium, Norway and Finland were grain deficit countries before the war and continued to be so. Belgium received bread grains and potatoes from Germany, France and the Netherlands in the first year of occupation, although the quantities traded fell sharply after 1942. Although the Belgians provided meat and fats to Germany in partial compensation, Milward's food trade figures show Belgium as a net food importer in most years of the war (Brandt, 1953: 468; Milward, 1987: 262. See also Kroener, 2000: 281). Norway exported, on average, half of its wartime fish catch to Germany, and received in return bread and feed grains and sugar products, and Finland, too imported bread and feed grains from Germany (Brandt,, 1953: 346, 367).

The eastern and south-eastern European countries had developed into significant agricultural trading partners with Germany in the pre-war years, as the IIA figures (see table A1) indicate. Comparing the IIA wartime figures with those in Brandt (1953), Milward (1987), Berendt and Ranki (1974) and Zagoroff et al (1955) suggests that data was not reliably reported to the IIA from these countries, and we are therefore reliant upon these secondary sources. In the case of Poland, these suggest that exports to Germany were more or less maintained until 1944. Brandt (1953: 51), for example, quotes average annual figures of 600,000 tons of grain and 40,000 tons of meat over the war as a whole, which are of the same order of magnitude as IIA figures for pre-war Polish exports, and shows bread grain (probably

mostly rye) exports increasing up to 1944. Milward (1987: 262) and Berend and Ranki (1974: 336) show the same upward trend. The latter argue, however, that this simply represented the removal of an increased proportion of production, which was declining as forced labour was deported to Germany. Where German control was less effective, as in the south eastern European countries, the overall level of food exports to Germany fell during the course of the war. Zagoroff et al (1955:73) suggest that the average index for Hungary, Romania, Bulgaria and Yugoslavia combined fell to 34.15 in 1940-42, and 13.11 in 1943-45 (1934-38 = 100). Together they had exported 1.25 million tons of wheat in an average pre-war year; the average for 1943-5 was only 153,000 tons (Zagoroff et al, 1955: 135). It was not only a problem of decreased wartime output resulting from shortages of labour and fertilizer. The fact that Germany was often unwilling to pay for what it acquired meant that suppliers were unwilling to trade except under duress (Berend and Ranki, 1974: 326-334).

The other south-eastern European country, Greece, was a special case. It was a significant food importer before the war – nearly half a million tons of cereals – and paid for its imports by exporting the currants produced in the Peloponnese. After the occupation in April-May 1941 inter-regional trade was forbidden by the Germans, so the cities and the Greek islands, which produced cash crops but were reliant on the mainland for staples, were most vulnerable to food shortages. But in addition Greece was cut off from its traditional suppliers by Allied blockade. Food shortages were apparent by June 1941. By December of that year people were dying on the streets of Athens and the blockade policy had become a matter of considerable controversy, producing arguments both within the UK government, between the Foreign Office, which was in favour of relaxing the blockade, and the Ministry of Economic Warfare, which was not, and between the UK and the USA, which was in favour of relaxing the blockade. There was also a dispute between the Germans and the Italians when the former argued that the latter were responsible for the provisioning of Greece. The blockade was eventually lifted in the summer of 1942, but by that time 40,000 people had starved (IIA, 1947; Mazower, 1993; Hionidou, 2006).

The conclusion to be reached from this mass of data is that neither western Europe nor south-eastern Europe could be relied upon to solve Germany's food acquisition problems during the war. The principal source of food that has not yet

been discussed is Italy, and although it is true that the value of imports from Italy, especially in 1941 and 1942, was as much as those from Denmark and France, they were principally made up of fruit and vegetables, and so did little to help overcome the shortages of grains, especially feed grains, meat, and fats (Milward, 1987: 262; Brandt, 1953: 604). Hence, as both Milward (1987: 260) and Tooze (2007: 418-425) have argued, the attractions of the USSR, and especially the Ukraine, as a potential source of food. In the long run it was obviously a gamble that failed. Even in the short run, although Germany received some cereals, oilseeds, meat and sugar from the occupied east, far more of the production from the former Soviet lands went to feed the Wehrmacht fighting there. The net gain was only a little larger than the level of trade with the Soviet Union in the eighteen months before the German invasion, and the cost of acquiring it in terms of tractors, other machinery and seeds delivered to the least, not to mention human lives, was high (Deist et al, 1990: 361; Kroener et al, 2003: 209, 220).

Wartime trade and the neutral countries

The neutral countries in Europe – Ireland, Sweden, Switzerland, Spain and Portugal – were affected in different ways by wartime changes in agricultural trade. The figures in tables A2 - A9 suggest that Ireland was probably affected least, in that most of its pre-war trade was with the UK, and the shipping lanes across the Irish Sea were too easily patrolled to make them vulnerable to U-Boats. The major impact probably came from the higher prices for which they could sell their exports. In contrast, Switzerland was heavily dependent upon imports and surrounded by combatant countries. Sweden had built up significant stocks of bread grains in the anticipation of war, and during the war itself attempted to maintain the normal trade pattern in which the UK received bacon, ham and pork, while Germany took cattle, sheep and pigs on the hoof (Milward, 1987: 246; Medlicott, 1952: 142 and 243). The country that attracted most attention from the Allies was Spain. Spanish agriculture had been seriously affected by the civil war. By 1939 Spanish grain output was 21 per cent down from its 1935 level and the country had changed from an agricultural exporter to dependency upon grain imports. At the same time the fascist fascination with autarky meant that government agricultural policy attempted to produce cereal self-sufficiency, while at the same time keeping grain prices low for the sake of consumers. It was a contradictory policy that inevitably failed, and by 1940 the UK

was worried that food shortages would drive Spain into alliance with Germany. Accordingly, it provided financial help, and navicerts (see above) for exports of UK-controlled Argentinian wheat stocks to Spain. After the summer of 1941, however, Spanish harvests began to improve, and earnings from the export of metal ores to Germany enabled Spain to buy its own cereal imports. It also developed a profitable line in leather exports: 35 per cent of the hides used in clothing by Germany came from Spain. Thus, as tables A2 and A4 suggest, imports of wheat and feed grains by neutral countries were, in general, maintained through the war (Medlicott, 1952: 509, 538, 548; Leitz, 2000, 118, 132; Harrison, 1978: 153, 157-8).

Postwar agricultural trade

The end of the war in Europe, in military terms, came on 8 May 1945, but that date does not represent the end of one era and the beginning of the next as far as agricultural trade is concerned, because wartime trade problems and their causes remained in force. The postwar food shortages affected the whole world, and the explanations identified by the UK government's report on the crisis included, in addition to the devastation of war, the difficulties of extracting food from farmers, the increasing demand for protein, droughts in Europe, French North Africa, New Zealand and India, and world transport problems. Grain production for export had declined in Australia and Argentina during the war, largely as a result of the difficulty of obtaining shipping space, and in Argentina grain and linseed stocks had been burnt for fuel in the absence of coal and oil (Cmd.6785, 1946: 3). The notable exception to this was the export performance of the United States of America, which on average in the five post-war years sold nearly ten times as much wheat abroad as it had exported in the five pre-war years (see table A10). Decreased industrial production and the wartime consumption of gold and dollar reserves in Europe also reduced the ability to pay for food in the main importing countries. European countries had also lost their share of world shipping earnings through wartime losses, and even the absence of a tourist trade in the war had affected European dollar earnings. Shortages of fertilizer, machinery, draught power and labour hindered agricultural production across the world. Inflation and a shortage of hard currencies, the existence of displaced persons, the Russian policy of restricting the pre-war grain export trade from eastern to western areas of Germany ('snaffled by Joe' [Stalin], in the words of the British diplomat Sir Alec Cadogan), the impact of guerrilla war in Greece, where only 25 per

cent of the 1947 cereal crop was harvested, and finally the cold winter of 1946-7, followed by the summer drought, all reduced Europe's ability to import food or produce its own (Birchard, 1948; United Nations, 1948: 23-4; Dilks, 1971: 768).

By 1950, however, the volume of trade had returned to pre-war levels. In addition to the cessation of hostilities, it was also the establishment of a series of institutions that produced the recovery. Between 1944 and 1947 the United Nations Relief and Rehabilitation Administration (UNRRA) spent over a billion dollars on food for Italy, the USSR and central and eastern Europe, and another $247 million on seeds, fertilizers, horses and tractors. The United Nations Food and Agriculture Organisation was established by the Hot Springs conference of 1943 and recommended the abolition of trade barriers for agricultural products (Cmd.6451, 1943: 33-34). The European Recovery Programme, better known as Marshall Aid, spent about 3 billion dollars on food, feedstuffs and fertilizers for Europe (Killick, 1997: 2, 62, 91, 101). There were also commodity trade agreements. In 1949 the FAO noted that about 80 per cent of world trade in food and agricultural products was covered by bilateral trade and payments agreements, and in 1950 it found that under the International Wheat Agreement, half of international wheat exports moved at prices below free market prices (FAO, 1949: 15; FAO, 1950: 7). Like many foreign policy instruments, the Marshall Plan was a response to domestic politics. As Friedmann (1992) argues, during and after the war the USA had accumulated large public stocks of surplus wheat as a result of New Deal price support programmes, and the Marshall Plan was a way to increase its export trade despite the lack of dollars on the part of prospective importers. The same mechanism was later, in 1954, adapted to the provision of food aid through PL 480.

Conclusions

Any account of international trade ideally rests upon a firm foundation of comprehensive and consistent statistics. For the pre- and post-war periods the major problem in producing this foundation lies more in comprehensiveness than consistency. In other words, the figures for quantities traded are readily available; the problem lies in reducing the mass of available statistics to something that can be understandably summarised. For the wartime years there is an additional problem, in

that the figures for the Allies seem more comprehensive and reliable than those for the Axis powers, despite the fact that the IIA was located in Rome. And ideally the figures for the volume of trade would be supported by price data so that the market impact of volume variations could be determined. Clearly, none of these problems has been solved in this paper, so it cannot claim to be the last word on the topic.

It should be clear, however, from the foregoing discussion, that agricultural trade had an impact on the outcome of the war, that the war affected trade, but that the basic pattern of trade returned to its pre-war normality after about 1950, with some important changes.[2]

There are three main aspects to the impact of trade on the war. Probably the least significant is the way in which the Allies used preferential access to food supplies for the Spanish government in order to dissuade them from open alliance with the Axis powers. Given what is now known about the relationship between Spain and Germany, and in particular between Franco and Hitler when they met in October 1940, such an alliance may never have been likely, but whether that was apparent to the Allied governments at the time is another matter (Kershaw, 2000: 329-30). Rather more important is the maintenance of food supplies to the United Kingdom. Although domestic production of staple foods such as wheat, potatoes and milk was increased during the war, and the level of imports decreased, it is difficult to see how the UK could have fed its population without the supplies it received from Ireland, the USA, Argentina, Australia and New Zealand, and most especially Canada. From the opposite perspective, however, Roberts has demonstrated the importance of shipping space considerations in the timing of the invasion of Europe, so the war might have been brought to a conclusion more quickly if shipping space had not had to be devoted to UK food imports (Roberts, 2009). But the greatest influence of agricultural trade was its role in bringing about the German invasion of the USSR. The data presented here clearly supports Adam Tooze's contention that the possibility of acquiring raw materials, of which food was a prominent component, was one of the

[2] According to Aparicio et al (2009: 69-70) the volume of world trade in 1935-8 was $16.5 billion, measured in 1925 US dollars, and in 1951-4 was $75 billion, measured in 1980 US dollars. Since $4.46 1980 dollars were equivalent to $1 1925 dollar (see www.measuringworth.com, using the GDP deflator), the prewar trade volume was ($16.5 x 4.46 =) $74 billion in 1980 dollars, i.e. roughly equivalent to the 1951-4 figure.

principal reasons behind the decision to invade (Tooze, 2007: 418-425). It is impossible to know now whether the decision would have been different if more food had been available from the occupied countries of western Europe and Germany's trading partners in south-eastern Europe, or if German domestic production had been capable of more rapid expansion, or if the German government had been less sensitive to the domestic political implications of food shortages. What is clear is that none of these conditions applied, the invasion took place, and the result, in the end, was disastrous. This is perhaps the nearest that the history of food supplies comes to repeating itself. Whereas Offer (1989) argues that food shortages were one of the principal factors behind German defeat in the First World War, it is difficult to sustain precisely the same argument in the Second World War. Part of it – that overseas traders were successful in maintaining supplies to the UK – is certainly true, but food only seems to have been in really short supply in Germany in the last year of the war, by which time military problems had a much bigger influence on its outcome.

Turning from the impact of agricultural trade on the outcome of the war to the impact of the war on trade, the most obvious result is the change in the trading partners of the eastern European countries. Whereas before the war their principal markets had been in the industrial countries of central Europe, meaning Germany and to a lesser extent Czechoslovakia, by January 1949 they were all (with the exception of Yugoslavia) members of Comecon and agricultural trade with the west had virtually ceased (Judt, 2007: 171). How, then, was Germany, and other western European countries that had imported from eastern Europe, to be fed? Mazower (2009: 595) gives the credit to the Common Agricultural Policy (CAP) of what became the European Union, but since it was not effectively in operation until the mid-1960s he cannot be correct. In fact what happened, as we have seen above, was that the USA supplied much more food to world markets than it had done before the war, and, just as importantly, enabled European importers to acquire it, initially through the activities of UNRRA, and subsequently through the Marshall Plan. Given this breathing space, the continental countries of western Europe, by the beginning of the 1950s, were beginning to increase their domestic output, so that by the end of the 1960s they were achieving a level of self-sufficiency that would have pleased and surprised wartime German economic planners.

The one constant feature of the pattern of agricultural trade over the whole period from 1935 to 1955 was the position of the United Kingdom as the dominant food importer. While it is true that it increased domestic agricultural output rapidly both during and after the war, and was consequently less dependent upon imports, it remained, as table A10 indicates, by far the greatest single importer in the world market, and would do so until it became part of the CAP in 1973. Again, its ability to import food after it had lost so much of its export production capacity and foreign assets during the war was helped considerably by the Marshall Plan, and by the forbearance of its Dominion trading partners.

Against the long term perspective of a global market in agricultural products that developed in its present form from the 1870s, and continues to operate to the present day, the events of the six years between 1939 and 1945 may appear insignificant, dramatic though they were at the time. In the long term, Aparicio et al (2009: 69) argue, following the Second World War, '…world agricultural trade adopted other patterns, which bore little resemblance to the complementarity between industrial and agro-exporting countries.' This examination of the war years suggests that the immediate effect of the war on agricultural trade was limited. The major change it produced was the re-emergence of the United States as a cereals exporter. Apart from that very significant difference, the pattern of trade in the post-war years was structurally similar to that of the pre-war years. The long run change away from complementary trade correctly identified by Aparicio et al presumably occurred in the later 1950s or even later, possibly after the initial formation of the Common Agricultural Policy of the EU.

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Statistical appendix

Table A1: Imports and exports in selected countries and regions, 1934-8 (‘000 tons)

IMPORTS 1934-8 000 tons	Wheat	Rye	Coarse grains	Potatoes	Beef	Pork	Bacon	Canned meat	Butter	Cheese	Eggs
UK	5681	-	4308	209	702	64	389	65	487	145	158
Austria – Germany	941	216	1826	125	66	72	10	-	77	32	84
Italy	709	-	304	69	43	1	-	-	-	4	6
France	646	1	896	140	13	2	-	6	2	15	13
Occupied importers	2826	561	3111	90	31	11	2	1	6	23	5
Spain & Portugal	35	-	97	38	-	-	-	-	-	-	33
Neutrals	937	20	881	42	-	2	2	-	1	3	14
Total imports	11775	798	11423	713	859	152	403	72	573	222	313
EXPORTS 000 tons											
Western Europe	499	-	144	464	168	20	265	11	243	121	173
Eastern Europe	1148	499	1857	-	35	56	26	14	8	-	61
USSR	-	-	312	-	-	11	-	-	-	-	-
Canada	4823	45	431	-	36	4	70	2	2	33	-
USA	1258	37	1007	-	7	6	27	5	-	1	-
Argentina	3341	115	7230	-	425	-	6	70	-	-	-
Australia & NZ	2787	-	73	-	107	27	-	4	239	95	10
Total Exports	13856	696	11054	464	778	124	394	106	492	250	244

Notes to table A1 and tables A2 – A9

Sources: International Institute of Agriculture (1947), *International Yearbook of Agricultural Statistics, 1941-2 to 1945-6*, volume 2, International Trade. Rome: the Institute. [British Library Ac.3382.c/4.(2.)]; FAO (1949), *Yearbook of Food and*

Agricultural Statistics, 1948, volume 2, Trade. Washington D.C.: the Food and Agriculture Organisation of the United Nations. The IIA figures are given in thousands of quintals (10 quintals = 1 tonne) and the FAO figures are in thousands of tonnes, but after dividing by 10 the former agree precisely with the latter. Where these figures can be checked from independent sources they also agree. For example, using the Statistics Canada series for wheat and wheat flour exports (M305) for 1934-8, the difference is only 1.6 per cent, and for cheese exports (series M426) the difference is 0.24 per cent (see www.statcan.ca).

Coverage: The data used to compile the table are for the main trading countries, *not* all countries. Hence the difference between import and export totals (although for all products apart from canned meat these differences are less than 20 per cent). The export totals may also be compared with the figures given by Tracy (1982: 143) who gives export figures for *all* world trade. This comparison shows that the table 1 export figures account for nearly 14.6 million tons of wheat and rye out of a world export total of 18.6 million tons for this period. For bacon the figures are 394,000 tons out of a world total of 428,000 tons of bacon, ham and lard, and for butter 492,000 tons out of a world figure of 616,000 tons. Restricting the coverage to European importers and their main suppliers therefore still captures a significant proportion of world agricultural trade. The individual European countries involved are mentioned in the text (although note that for some products, e.g. rye, Finland is counted as an occupied importer on the grounds that Germany took some responsibility for its supplies during the war. Figures for Germany and Austria are combined on the grounds that they effectively became the same country after the Anschluss and returned a single figure to the IIA for most of the period with which this paper is concerned.

Coarse grains are feed grains or animal feedingstuffs, the total of barley, oats and maize figures.

Beef totals are calculated from fat cattle numbers divided by 5 (on the assumption that the deadweight of the average carcase was 200 kg) plus the deadweight trade figures. Similarly, pigmeat figures are calculated from fat pig numbers divided by 20 (on the assumption that the average carcase weighed 50 kg) plus deadweight trade figures. In both cases live animals were relatively more important in intra-European trade and less so in inter-continental trade. No data is given on sheepmeat because the lamb and

mutton trades were not of much importance in continental Europe. The UK was the main importer of lamb, and the bulk of its supplies came from New Zealand.
Several countries were both importers and exporters of several products. Sometimes this reflected entrepot trade, or, in the case of potatoes, it resulted from the fact that countries such as Spain might export new potatoes and import maincrop potatoes, while the Netherlands did the opposite.
No data were collected on fruit and vegetables, oilseeds, wine, sugar, or tropical products and beverages. This is not because these were unimportant – oilseed supplies in particular were a major concern for Germany – but because the intra-European trade between temperate exporters and importers is difficult to disentangle, in the IIA world figures, from the trade between tropical exporters and temperate importers.

Table A2: Wheat and wheat flour imports and exports 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	5886	6629	6439	4050	4281	3941	4343
Austria-Germany	977	774	681	832	644	389	_
Italy	652	694	86	130	117	_	_
France	384	447	376	200	_	5	_
Occupied importers	2782	1529	288	466	175	273	1399
Spain & Portugal	387	850	560	409	568	612	671
Neutrals	946	790	289	575	359	322	444
Exports 000 tons							
Western Europe	879	378	132	692	331	333	66
Eastern Europe	2414	1035	228	159	268	166	_
Canada	5057	4614	6708	5154	7496	9591	10600
USA	2639	1076	1051	700	1123	1295	4987
Argentina	4878	3735	2448	2259	2069	2622	2596
Australia & NZ	2318	2640	1391	1202	1015	2378	417

Table A3: Rye imports and exports 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	3	46	_	_	_	_	_
Austria-Germany	133	159	96	305	217	1	_
Italy	63	35	_	59	166	_	_
France	3	4	_	2	1	2	_
Occupied importers	548	204	519	303	556	312	410
Neutrals	9	69	17	14	8	5	5
Exports 000 tons							
Western Europe	15	36	459	306	956	269	112
Eastern Europe	392	76	12	8	5	_	_
Canada	98	66	129	10	137	197	110
USA	2	23	_	_	2	1	126
Argentina	195	166	33	4	7	4	147

Table A4: Trade in Coarse Grains (barley, oats and maize) 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	3130	2660	749	133	66	119	732
Austria-Germany	912	1335	661	377	342	96	_
Italy	201	254	68	72	104	_	_
France	633	330	147	93	16	38	27
Occupied importers	2358	1240	60	75	66	6	287
Spain & Portugal	49	64	338	165	81	109	86
Neutrals	1005	740	241	186	47	93	158
Exports 000 tons							
Western Europe	118	109	55	60	200	37	7
Eastern Europe	1092	766	186	126	111	84	_
Canada	553	266	189	389	2126	2172	1573
USA	816	973	491	249	130	260	395
Argentina	3816	2481	747	309	287	759	921
Australia & NZ	77	87	14	22	22	22	_

Table A5: imports and exports of fat cattle (converted to beef) and beef, 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	825	771	758	679	518	583	370
Austria-Germany	131	122	141	195	147	49	_
Exports 000 tons							
Western Europe	213	223	158	178	118	134	148
Eastern Europe	2	10	5	_	_	_	_
Argentina	468	375	374	375	389	428	242
Australia & NZ	146	128	110	52	58	57	94

Note: the conversion of cattle traded on the hoof (i.e. alive) to a deadweight figure assumes that each animal produces a carcase of roughly 200 kg. Thus 5,000 head of cattle produce 1,000 tons of beef

Table A6: Imports and exports of live pigs (converted to pigmeat), pork, bacon and ham, 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK pigmeat	63	69	144	290	385	407	202
UK bacon & ham	401	243	279	331	340	406	248
Germany-Aus pork	88	175	93	27	57	64	_
Germany –Aus bacon & ham	11	7	2	_	_	_	_
Italy pigmeat	_	2	2	5	7	_	_
Czech'kia pork	16	4	_	_	_	_	_
Czech'kia bacon	1	1	_	_	_	_	_
Sweden bacon	2	1	1	5	5	2	_
Exports 000 tons							
Denmark pork	14	67	54	24	56	87	19
Denmark B & ham	186	119	36	8	11	30	33
Netherlnd B & ham	38	10	_	_	_	_	_
Ireland B & ham	24	29	12	_	_	_	_
E.Europe pork	52	16	3	5	6	2	_
Sweden bacon	14	4	1	_	_	_	_
Canada bacon	85	159	211	240	255	316	204
USA B & ham	31	12	64	74	86	92	40

Table A7: Imports and exports of butter, 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	444	269	222	136	154	156	193
Germany-Austria	91	130	62	36	42	15	_
France	1	_	_	_	_	_	5
Exports 000 tons							
Denmark	150	108	53	36	50	53	61
Nether-lands	56	42	15	_	2	_	_
Ireland	13	13	6	_	_	_	_
Sweden	26	10	2	_	_	_	_
Canada	6	1	1	1	4	2	3
Australia	113	89	85	56	49	52	42
New Zealand	124	133	115	119	101	117	105

Table A8: Imports and exports of cheese, 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	145	159	207	320	210	256	194
Austria-Germany	31	56	31	15	9	1	_
Occupied importers	25	17	3	_	_	_	1
Exports 000 tons							
Western Europe	118	100	42	17	8	1	1
Eastern Europe							
Canada	41	48	42	64	59	60	61
USA	1	1	42	138	72	13	88
Australia	18	16	16	12	14	15	12
New Zealand	85	103	120	136	102	79	89

Table A9: Imports and exports of eggs, 1939-45 (000 tons)

Imports 000 tons	1939	1940	1941	1942	1943	1944	1945
UK	212	112	66	26	18	25	52
Austria-Germany	102	142	76	29	12	3	_
Italy	10	8	7	8	2	_	_
France	8	12	15	7	_	_	_
Exports 000 tons							
Ireland	20	24	20	17	12	13	13
Denmark	103	81	33	6	2	3	9
Nether-lands	101	75	22	_	_	_	_
Bulgaria	15	20	22	14	5	1	_
Poland	16	_	_	_	_	_	_

Table A10: Imports and exports of major products, 1946-50 and 1950-54 (000 tons)

Imports 000 tons	Wheat 46-50	Wheat 50-54	Rye 46-50	Rye 50-54	Beef 46-50	Beef 50-54	Pig-meat* 46-50	Pig-meat* 50-54	Cheese 46-50	Cheese 50-54
UK	4915	4440	_	_	491	339	355	485	187	155
Austria-Germany	2886	2743	265	295	17	57	38	47	14	52
Italy	1734	1112	_	_	16	47	_	_	4	16
France	933	358	_	_	20	6	14	4	10	13
Occupied importers	2151	2381	361	407	48	16	14	_	28	32
Spain & Portugal	552	502	_	_	_	_	_	_	_	_
Neutrals	609	726	_	_	_	_	_	_	4	5
Exports 000 tons										
Western Europe	302	856	_	_	140	270	123	312	83	185
Eastern Europe	12	219	195	62	_	10	30	62	_	_
Canada	4678	8089	216	248	101	59	112	43	29	11
USA	10899	8983	91	73	39	3	129	39	55	13
Argentina	2117	2186	187	333	320	138	83	74	_	_
Australia & NZ	2578	2748	_	_	84	89	56	74	110	123

* including canned meat (some of which was beef)

Source: FAO (1948); FAO (1952); FAO (1955).