This assumed the form of a more intensive and better cultivation of the soil, high-yielding varieties and liberal application of chemical fertilizers in addition to the farm-supplied. Under the stimulus of these factors, rice yields increased from 43 bushels (rough rice) per acre in 1878 to 75 bushels in 1935-1939 or 73 percent. These yields are from two to three times larger than any in the typically rice producing areas of the Far East and Southeastern Asia. But in more recent years the increase in yields has been relatively slight, and the likelihood is that in the future the yield will not be increased at as rapid a pace as in the past. There are indications that neither the additional human efforts nor the greater applications of fertilizers is likely to result in a proportionate increase in yields.

(3) Japanese farmers have raised the agricultural output by growing on one-third of the land two successive crops each year. The net result is a harvested area of 19.9 million acres (1939) as against a cultivated area of 14.9 million acres. This system of double cropping is a good way of expanding the crop acreage, particularly in Japan where the cultivated area cannot be appreciably increased. The only difficulty is that the harvested area, too, has shown little expansion in recent years. By improving facilities for irrigation and drainage approximately a million acres of one-crop rice fields could be changed into two-crop fields. It would take, however, a great deal of time and money to carry the project out.

2. Wartime factors. As the war continues, Japan is being forced to divert an increasing proportion of the chemicals, otherwise available for fertilizers, for munition purposes. The shortage of farm labor is reducing the output of green manure, while the requisitioning of horses is likewise diminishing the production of farm-yard fertilizers. The drafting of the most able-bodied of the farm population, the movement of large numbers of farmers into the cities for war-work, and the decline in draft power, are the other very important factors that weakened the intensive character of Japanese agriculture. The result is a corresponding decrease in the total output. Also, it is almost certain that Japan's military defeat with all its psychological, political, social and organizational implications will further impair the productive capacity of the land.

3. Recommendations. Many of the wartime difficulties can be overcome, but the fundamental features peculiar to Japanese agriculture in and out of war militate against an expansion, especially immediately after the war. For these reasons, it seems desirable that the program of land utilization in Japan in 1946 might at best aim at a pre-war harvested acreage of not quite 20 million acres, and an area of between 18 and 19 million acres is perhaps nearer the attainable goal. This suggestion is based on the following assumptions: some of the cultivated land abandoned during the war could hardly be restored in the year or two following Japan's defeat; the supply of farm labor will be ample, but that of draft power, and especially of fertilizers, will fall short of requirements. The cultivated acreage may be increased somewhat by planting to food crops some of the land now used for war plants, airfields, parks, etc. However, for reasons above indicated, it would be well to concentrate first on land already in cultivation, which carries the promise of highest yields.

Some changes in the distribution of the total harvested area may be anticipated. The single most important reduction in mulberry acreage, which took place in wartime, should be left unchanged (Guide, p. 124). Japan will undoubtedly experience a considerable shortage of rice and of other cereals, but because of expected shortage of fertilizers, some acreage reduction is advisable. Japan produces only a third of its soybean consumption, but the abundant supply available in Manchuria and the proximity make the need for domestic production less urgent, even though the importance of the crop as a food is very great. Hence, soybean acreage could be reduced. It is assumed that Manchuria will not remain within Japan's economic orbit, and the imports will have to be paid for by the Japanese. Acreage under vegetables, potatoes, industrial crops, tea, green manure crops, and of other crops may be maintained at pre-war levels.

Table 7 gives a comparison of 1939 land utilization with that estimated for 1946.

The 1946 acreage goals are tentative, and do not take into consideration the acreage under home gardening. (The latter has been practiced during the war, and should be encouraged after as a means of alleviating the urban food shortage.) What the acreage will actually be will depend upon area suitable for cultivation, the supply of fertilizer and draft power. Above all, the acreage will have to be adjusted to the available fertilizers, and the relative importance of rice as against the other cereals, or cereals in general as against root crops. Decisions in these matters can be made more profitably by the occupation authorities on the spot.

It is desirable that thorough consideration be given to the problem of whether the wartime system of assigning acreage quotas in Japan will be applicable during the period of military occupation. If the existing system of a compulsory prescription of acreages is found operative, its maintenance is advisable. If the system has broken down because of shortages from which Japanese agriculture suffered during the war, the restoration of the system if found necessary, will have to be adjusted to the means at hand. If, on the other hand, the stipulated acreage goals are not carried out because of the farmers' refusal to comply, compulsion might be introduced. It seems that perhaps the most effective way of securing compliance would be threat of non-delivery of fertilizers.

In the over-all planning of land utilization during the period of military occupation, and in the more detailed planning of prefectural, county, and village quotas, it might be well to enlist not only the services of the trained Japanese personnel (Guide, p. 77), but those of the agriculture association as well. The place of the latter in Japanese agriculture is discussed elsewhere in this Guide (p. 83), but it is well to stress at this point that it would be to the advantage of the Civil Affairs Administration to utilize at least some of the experience accumulated by the associations both before and during the war.

Table 7 - Japan: Land use, 1939 and suggested MG goals for 1946

Specified Crop	1939 1/		1946 2/	
	Acreage	Percent of Total	Acreage	Percent of Total
	1,000 acres		1,000 acres	
Irrigated rice	3/ 7,826	39.3	7,435	39.8
Cereals (dry crops):				
Wheat	1,827	9.2	1,827	9.8
Common barley	867	4.4	824	4.4
Naked barley	1,004	5.0	954	5.1
Oats	304	1.5	274	1.5
Millets (foxtail, proso, and barnyard)	279	1.4	279	1.5
Buckwheat	201	1.0	181	1.0
Corn	130	0.6	130	0.7
Total	4,612	23.1	4,469	24.0
Leguminous crops:				
Soybeans	795	4.0	595	3.2
Other beans, peasant peanuts	654	3.3	654	3.5
Total	1,449	7.3	1,249	6.7
Potatoes:				
Sweet	681	3.4	681	3.6
Irish	406	2.0	406	2.2
Total	1,087	5.4	1,087	5.8
Vegetables	1,022	5.2	1,022	5.5
Industrial crops:				
Sugar	50	0.2	50	0.3
Fibers	192	1.0	192	1.0
Oilseeds	251	1.3	251	1.3
Other industrial crops	261	1.3	261	1.4
Total	754	3.8	754	4.0
Tea	99	0.5	99	0.5
Mulberry	1,307	6.6	807	4.3
Green fodder	223	1.1	203	1.1
Green manure crops	1,153	5.8	1,153	6.2
Other crops	387	1.9	387	2.1
Grand total	19,919	100.0	18,665	100.0

Office of Foreign Agricultural Relations. 1/ Norinsho Tokeihyo, 1939, and The Statistical Abstract of the Ministry of Agriculture and Forestry, 1936-37. 2/ Estimated. 3/ Including 374,000 acres of upland rice, and approximately the same in 1946.

Labor, draft power and machinery

1. The Problem. Japan's intensive system of agriculture calls for the expenditure of an immense amount of labor. The Japanese high yields are rendered possible not only through abundant application of fertilizers, but also through careful cultivation, constant weeding, repeated application of fertilizers, painstaking watering of crops where irrigation is needed, in addition to multiple cropping. The work is carried on by the Japanese farmers almost exclusively by hand. With some minor exceptions, motor-driven machines are scarcely ever used in seeding, fertilizing or harvesting, although animal labor often is used in plowing.

Despite this garden-like cultivation of fields, Japan never suffered from a shortage of labor; on the contrary, the reverse is true, in consequence of rural overpopulation, or of "many people on little land." Even the steady pre-war drain of rural population into the industrial centers failed to make a serious dent in the total number of farm families: for many years past, their number and that of cultivated acres have remained practically unchanged (Handbook, pp. 15 and 22).

Cattle and horses, as well as farm power-equipment, are closely related to the question of labor on the farms. There human labor is abundant and cheap, animal husbandry as a source of draft power is not as important as on the large farms in other countries. Yet the significance of some 2 million cattle and 1.4 million horses for draft purposes and as farm-supplied fertilizer cannot be underestimated (Handbook, pp. 63-66).

The distribution of Japan's 15 million acres of cultivated land into some 94 million lots is characteristic of the type of agricultural economy, social usages and practices developed there. But whatever the reason, little, if any, mechanization can be practiced on such fields. This explains why the types of machines that have been used are confined expressly to the processing of products on the farms, rather than to raising crops.

But even mechanization in that narrow sense has been on a limited scale. In 1937 the Japanese farms had a total of only 188,000 motors with a capacity of 623,000 H. P., and a variety of machines numbering 376,000 (Table 8). The equipment is available to few farmers, since its distribution ranges from one motor per 8 households (Okayoma prefecture) to one motor per 621 households (Yamanashi), and one thresher or hulling machine per 20 acres in Hokkaido to one per 125 acres in the northeastern prefectures. But even limited in number and functions, the equipment, wherever it is available, performs a very useful function in those sections of the country where a seasonal labor shortage might occur.

The war has played havoc with the three sources of labor supply in the Japanese farms. This is particularly true of the principal source, manpower. And this undoubtedly will constitute one of the problems, albeit not a difficult one, confronting the occupation authorities.

Table 8 - Principal farm machinery in Japan, annual 1931, 1933, 1935, 1937

Kind of machine	1931	1933	1935	1937
	Number	Number	Number	Number
Threshers	55,954	67,259	91,735	128,620
Hullers	76,744	94,482	104,498	107,778
Wheat hullers	11,893	12,272	13,749	9,960
Rice cleaners	35,970	41,375	51,116	63,465
Wheat cleaners	6,530	7,703	10,329	11,307
Flour milling machines	5,855	7,339	8,866	10,230
Vertical pumps	13,280	15,198	16,146	26,027
Centrifugal pumps	13,660	16,660	16,467	18,236

Oriental Economist, August 1939, p. 516. Data supplied by Japanese Ministry of Agriculture and Forestry.

2. The Situation. As early as 1940 the Japanese Government became concerned with the problem of labor deficiency. A large number of farmers were recruited into the army, and as the mobilized soldiers were mostly in the prime of manhood, it could not but cause a marked decline in farm labor manpower. The movement of the rural population into the expanding armament industries was an equally important factor aggravating the situation still further. There could be little substitution by labor of women because they have always shared heavily in farm work. On the whole, as early as 1943 the situation, in the words of a Japanese publication, was something as follows:

"It is alarming to learn that, during the time when increased agricultural production is most needed, there has been an exodus of farmers from the agricultural fields. . . By approximate estimation, this exodus plus military conscription have drawn away from 50 to 60 percent of manpower from the villages. Last year there was a good harvest, yet everywhere there was felt the shortage of manpower. Therefore, it seems that the Japanese Diet should seriously consider this problem and find a way out." 1/

1/ Tokyo Keizai, March 6, 1943

The shortage of animal power also developed when a large number of horses were commandeered by the army. The shortage of horse power is felt with especial keenness in the northeastern prefectures where the period of agricultural production is short and where, consequently, all farming operations have to be carried out within a limited period of time. Nor can greater assistance be expected from the mechanical implements used on the farm. The few Japanese farm equipment plants must have been converted into munition factories, thereby impeding the output of farm implements or of replacement parts for the equipment already in use. It is safe to assume, therefore, that in course of the war the limited service rendered by the mechanical implements is being reduced greatly.

To relieve the labor shortage given rise by the war, the Japanese Government launched a number of schemes such as sharing of farm equipment, establishment of community kitchens and nurseries and large-scale mobilization of school children, students, shopkeepers, and housewives from the towns, and some workers from Manchuria. Out of these elements the Government formed what is referred to as Class A and Class B food production corps. The first, known also as the "agricultural soldier unit" or "shock brigade", numbers 60,000 and is supposed to be utilized at the proper place at the right time. The second group consists of some 500,000 youths from 17 to 18 years old who reside in agricultural areas. They volunteer their services for a period of two months during harvest time. In official circles the organization of these groups is viewed as steps toward a policy of "every person a farmer".

The army was induced also to release, during the farming season, a certain number of soldiers conscripted from the villages. The effectiveness of this and other measures was not sufficient to compensate for the great outflow of village labor in 1943. A more drastic measure was promulgated, therefore, to insure a greater supply of manpower for the 1944 crop year. This was the deferment from military service of all farmers cultivating more than three-quarters of an acre of rice. Such individuals are designated as "wartime agriculturists". Any farmer, however, who does not engage in farming for more than 90 days during the year would not fall within this category. With the institution of this measure, the Japanese Government has placed the same emphasis on food production as it has on vital munitions production.

3. Recommendations. Because Japan's farm labor shortage is purely a war phenomenon, it is assumed here that the latter will disappear with the defeat of Japan. The demobilized soldiers will be eager to go back to the land, and the imminent large-scale unemployment in the much expanded war industries will induce many workers to follow suit. A food shortage in the principal industrial centers might have the same effect. By virtue of the first two factors alone it can be envisioned that the back-to-the-land movement will be taking place without any conscious direction on the part of any agency. Regulation by the military occupation authorities may be necessary in order to prevent the exodus from assuming the form of a stampede, and to insure adequate labor in fields other than agricultural. But generally speaking, Japan's normal rural overpopulation will put an end to farm labor shortage no sooner the war that has given rise to it has been eliminated, i.e., no sooner Japan is defeated.

Somewhat more difficult will be the process of restoring draft power to the pre-war level. Military requisitions will have left the farms with perhaps no more than half the original number of horses, and probably reduce livestock numbers. In this connection it may be suggested that, first, upon demobilization army horses be returned to the farms; second, since this action could not fully compensate for the sustained loss, the wartime policy of encouraging horse breeding on farms, at the government expense, might be usefully maintained until the number of horses reached a level of at least 1.4 million. In wartime this called for the payment of 120 yen for each horse raised, and an additional 100 yen if the horse raised was considered good. There was also the additional provision that if within a period of three years up to 7 percent of the horses should die, the government would still pay 120 yen for each of the horses lost. It would be up to the occupation authorities to decide whether the problem is so urgent as to call for the continuation of such inducement terms.

In the question of mechanical farm equipment, which is small in number and simple in design, the reconversion of a few plants for the manufacture of such implements shouldn't offer too great a difficulty. The occupation authorities might appropriately consider this in any plan of industrial production for civilian use. The types of machines and prime-movers in use fit well the needs of Japanese farmers, and changes are not advisable. There is evidence of an appreciable increase in numbers between 1937 and 1939; rice-hulling machines and electric motors accounted for most of the expansion. It would be well, therefore, to aim at a total supply of about 430,000 units of equipment and 215,000 electric motor and gasoline engines. This is an over-all increase of 15 percent above the 1937 equipment.

Even if the occupation authorities should find it possible to supply the farms with a much greater number of machines, such a move would not be advisable, for at least one reason: it would increase the number of unemployed in the rural districts at a time when industry and agriculture will suffer from an abundance of labor. In addition, a defeated Japan will be too short on capital, especially during the period of transition from war to peace, to permit itself the luxury of greater mechanization for which there is no special need.

Fertilizers

1. The Problem: A noteworthy feature of Japan's agriculture is the high level of yields. A comparison of rice yields with those of other rice-producing areas of the Far East and Southeastern Asia bears this out. The same is true to some degree of other grains. This attainment is the more significant when one considers that some of Japan's agricultural practices (double-cropping, absence of crop rotation and of a livestock economy) make severe demands upon the soil which does not possess a high degree of natural fertility.

The principal explanation of this achievement lies in the large applications of fertilizers on the Japanese fields. In fact, fertilizer as a means of increasing production is used there to a greater degree than in most other countries. It has been difficult, however, to supply fertilizer requirements during the war, and upon occupation of Japan, our civil affairs officers may be confronted with an even more difficult problem of finding the quantity of fertilizer necessary to maintain production at pre-war levels.

2. Pre-war Fertilizer Consumption. The kinds and quantities of fertilizers consumed in the immediate pre-war period may be obtained from data for the year 1938. It was estimated (Table 9) that the total consumption of fertilizers during that year was sufficient to apply on each cultivated acre, in terms of the nutrient, an average of approximately 110 pounds of nitrogen (N), 61 pounds of phosphoric acid (P_2O_5), and 67 pounds of potash (K_2O). In terms of the most common mineral fertilizers actually used, this means 537 pounds of ammonium sulphate, 294 pounds of superphosphate, and 134 pounds of potassium sulphate. The percentage distribution of the nutrient elements in fertilizers used in Japan is shown in Table 10.

The notable feature of the data presented in Table 9 is the large utilization of nitrogenous fertilizers, made necessary by the intensive cropping of the Japanese soils. When fertilizers, particularly nitrogenous fertilizers, are not applied, Japanese crop yields are seriously reduced (Handbook, Table 23). A summary of data from soils of all Japan shows that without the addition of any fertilizer at all the average yield was 48 percent below the yield of plots fully fertilized with nitrogen, phosphorus and potassium. When nitrogen alone was absent, average rice yields were 45 percent lower. If plots lacked phosphorus only, the drop in yield was 12 percent; and in the absence of potassium, it was 9 percent.

Table 9 - Estimated consumption of fertilizers in Japan, 1938

Sources	Nitrogen			Phosphoric Acid			Potash		
	Amount consumed 1/	Percent N 2/	Nitrogen content	Amount consumed 1/	Percent P_2O_5 2/	P_2O_5 content	Amount consumed 1/	Percent K_2O 2/	K_2O content
	1,000 m.t.	Percent	1,000 m.t.	1,000 m.t.	Percent	1,000 m.t.	1,000 m.t.	Percent	1,000 m.t.
Commercial Chemical									
Ammonium sulphate	713.0	20.5	146.4						
Calcium cyanamide	210.8	22.0	46.4						
Superphosphate				582.0	20.4	118.7			
Potassium sulphate							95.0	50.0	47.5
Potassium chloride							13.8	60.0	8.3
Sodium nitrate	25.8	16.0	4.1						
Compound fertilizers	1.113.0 3/	9.8	109.1	1,113.0 3/	7.7	85.7	1,113.0 3/	3.2	35.6
Sub-total			306.0			204.4			91.4
Lbs. per cultivated acre			45			30			14
Commercial Organic									
Soybean cake	833.0	7.0	58.3	833.0	1.5	12.5	833.0	2.0	16.7
Rapeseed cake	38.8	7.0	2.7	38.8	1.5	0.6	38.8	2.0	0.8
Cottonseed	47.9	7.0	3.4	47.9	2.5	1.2	47.9	1.5	0.7
Other oil cake	92.3	5.5	5.1	92.3	1.0	0.9	92.3	1.5	1.4
Fish products	327.5	9.4	30.8	327.5	4.2	13.8	327.5	0.6	2.0
Bone meal	39.0	4.1	1.6	39.0	19.7	7.7			
Sub-total			101.9			36.7			21.6
Lbs. per cultivated acre			15			5			3
Farm-Supplied									
Farmyard manure	39,109	0.58	226.8	39,109	0.3	117.3	39,109	0.5	195.5
Night soil	16,057	0.57	91.5	16,057	0.13	20.9	16,057	0.27	43.4
Green manure	6,043 4/								
Fuel ashes				1,095	3.5	38.3	1,095	8.9	97.5
Sub-total			335.2			176.5			336.4
Lbs. per cultivated acre			50			26			50
GRAND TOTAL			743.1			417.6			449.4
Lbs. per cultivated acre			110			61			67

Office of Foreign Agricultural Relations.

1/ Except for the farm-supplied fertilizers, data are from the Japan Year Book 1940-41, pp. 532-533. They take into consideration domestic production, imports from abroad and from the colonies, exports abroad and to the colonies, and amounts "consumed as raw materials".

The farm supplied manures, except for fuel ashes, are based on data presented in Gradjdanzev, A. J., Statistics of Japanese Agriculture, Institute of Pacific Relations, 1941, p. 15.

Data for fuel ashes are based on the assumption that each Japanese family supplies to agriculture an average one-half pound per day of mixed wood and grass ashes. This figure, it may be noted, is some 15 percent lower than an estimate made by Professor F. H. King for 1908 (King, F. H., Farmers of Forty Centuries, 1911, p. 296), when [it is likely that] on the average, more wood and grass probably were consumed for fuel by individual families but when the total population was only 66 percent of that in 1938.

2/ Taken in part from Gustafson, A. F., Handbook of Fertilizer, 1939. The larger part is taken from figures given for Japanese fertilizing materials in Nambu, M., Rice Culture and Rice Grain, 1927, pp. 469-470.

3/ No indication of the actual formula for this fertilizer was given. When the amounts of bone meal and the various mineral fertilizers listed as "consumed as raw materials" were added together, however, [it was found that] the total nearly equalled the figure given for compound fertilizers which are made up of these materials. The formula they make (9.8 - 7.7 - 3.2) is one which would appear to be suitable for rice culture.

4/ Represents one-half the nitrogen content given for fresh legume green manure, on the arbitrary assumption that one-half has originated from supplies in cultivated soil. No phosphoric acid and potash are represented to have been added through green manure, because the amounts carried by this material have ben taken for the most part from supplies in cultivated soil.

Before the war the development of the Japanese chemical industry has enabled Japan to produce most--but not all--of the principal nitrogenous fertilizers. These consisted chiefly of sulphate of ammonia and calcium cyanamide. Domestic production of superphosphate also has increased, but is dependent on imports of phosphate rock. Imports from the Japanese South Sea Mandated Islands accounted for about a third of the total, the remainder coming from Egypt, the Straits Settlements, and the United States. Potash also used to be imported, largely from Germany and partly from the United States. As to commercial organic and farm-supplied fertilizer, their respective positions are indicated in Table 9.

3. Wartime Production and Consumption. The heavy demands upon fertilizers in peacetime have increased greatly in wartime, with the rising deficiencies of other factors of production such as manpower and draft power. It is clear from official statements, however, that the high quantitative standards of fertilizing attained in the 1930's could not be maintained during the war, although the shortage is difficult to determine.

This shortage is due first of all to reductions in the wartime supply of commercial organic fertilizers, particularly in fish products. There is evidence to indicate a proportionate increase in human consumption of fish as food, and a decrease in their use as fertilizers, since the size of the catch is hardly more than 50 percent of that of pre-war. Only fish scrap is used as fertilizer, the remainder being converted to food uses. Farm-supplied fertilizers have probably been reduced in consequence of labor shortage, draft power, and the probable decline of acreage under green manure.

The shortage of chemical fertilizers is also admitted. In the case of superphosphate it is readily understandable, since most of the raw materials used in its manufacture have customarily been imported. Outside supplies of potash have also been cut off. But vastly more important is the shortage of nitrogenous fertilizers. There is evidence that even before the war farmers could not obtain as much ammonium sulphate and calcium cyanamide as they needed.

Nitrogenous fertilizer production is estimated to account for about 70 percent of the total productive capacity of the nitrogen chemical industry, the remaining 30 percent being devoted to the manufacture of munitions and mining explosives. Since priorities for munitions and mining explosives have undoubtedly risen sharply during the war, a corresponding decline in the output of fertilizers would be inevitable unless the total capacity of the nitrogen fixation industry had expanded. This probably has been the case, but judging by official pronouncements, such developments have been insufficient to meet the total need.

Before the war the total nitrogen fixation industry, which supplies chemical nitrogen fertilizers, consisted of an estimated 24 plants, widely scattered. The nearest approach to centers of production is a series of plants running roughly parallel to the shores of the Japan Sea from Ishikawa and Ryokanose to Takefu, the three plants in Hyogo prefecture, and the three plants in the Ube, Hiroshima, Yawata Region. Yet the industry is characterized by considerable concentration, since 13 plants, or 54 percent of the total number, account for 85 percent of the estimated productive capacity.

4. Effects of Fertilizer Elimination. From the point of view of the occupation authorities who will be called upon to deal with the fertilizer supply problem, the possible destruction of a large part of the chemical industry prior to or in the course of the occupation of Japan is worth considering. Thus, it is estimated that a complete elimination of all supplies of chemical fertilizers containing nitrogen, assuming the availability of nitrogen from other sources, would cause a decrease in rice yields of about 20 percent compared with what might have been expected under similar weather conditions before the war. If a reduction of such proportions should occur, it would affect also crops other than rice; limiting it only to this staple, the reduced yields might cause a reduction of approximately 1.7 million metric tons of rice. This is roughly the combined average yearly rice imports from Korea and Formosa (1933-1937), or the volume of rice that could feed some 13 million people on the basis of the early 1943 ration of .9 koku per head.

If such a development came to pass, it might result in serious effects of other kinds, particularly when combined with other problems of adjustment which the farmers will have to face under the new conditions. For a large proportion of the farm population perpetually living on the margin of subsistence, not only would purchasing power be lost, but the volume of food for their own consumption would be reduced. Viewed in this light, attention to the fertilizer problem on the part of the occupation authorities would seem urgent.

5. Recommendations. If the agricultural production of Japan is to be restored to the 1939 level in the shortest possible time, a fertilizer consumption of not less than the volume indicated in Table 9 would be required. In view of the expected scarcity of chemical fertizers, an amount equal to the normal volume of consumption may seem high. Consideration must be given, however, not only to the normal needs of the soil, but also to the question of soil deterioration due to intensive cropping and deficient supplies of fertilizer during the war years. Planning, therefore, on the basis of 110 pounds of nitrogen, 61 pounds of phosphoric acid, and 67 pounds of potash per acre is not necessarily too generous, but as will be indicated in subsequent paragraphs, the pre-war rates will be hardly obtainable. A more practical approach might be an estimated utilization based on 100, 60, and 40 percent of N, P_2O_5, and K_2O, respectively, for the occupation period.

a. Farm-supplied. In order to obtain the total quantities indicated, attention would naturally be directed first to farm-supplied fertilizers. A move that might be adopted immediately upon occupation would be to encourage an increase in the production and use of locally supplied materials. Reports indicate that the Japanese authorities have already stressed such a program, and efforts probably should be continued along the same lines. This means a full use of well-adapted types and varieties of legume crops and, of course, restoration of livestock numbers to pre-war levels.

Night soil collection also should be given more attention. Many villages and towns are without modern systems of handling sewage. This is an important problem both to the town and country, and those in

charge of administering local communities must see that the farms receive this material. In most cases, the procedure will consist in the reestablishment and in the strengthening of old practices.

b. Commercial Organic: In the second place, the sources of commercial organic fertilizers must be exploited. Manchuria would naturally be expected to continue as the principal supplier of soybean cake. Barring any transportation difficulties, the usual pre-war imports of this fertilizer of approximately 850,000 metric tons are very probably obtainable, judging by Manchuria's present soybean output. More difficult will be the securing of some 30,000 metric tons of pure N content, formerly obtained from approximately 300,000 tons of fish products. This calls for a restoration of the fishing industry, a process that might take too long to complete. This fish product fertilizer could be replaced by 150,000 metric tons of ammonium sulphate, but for the anticipated difficulties of obtaining chemical fertilizers immediately after the war.

c. Commercial Chemical: The grestest problem in Japan's fertilizer supply during the period of military occupation will probably be securing chemical fertilizers, particularly types supplying nitrogen. Assuming that farm-supplied and commercial organic materials provide 55 pounds of N per acre, 45 pounds would remain to be furnished from chemical materials (Table 10). This calls for a total of 305,000 metric tons of nitrogen (Table 11).

Table 10. - Source of nutrient elements in fertilizers used in Japan, 1938

Nutrient Sources	Nitrogen N		Phosphates P_2O_5		Potash K_2O	
	Pounds per Acre	Percent of Total	Pounds per Acre	Percent of Total	Pounds per Acre	Percent of Total
Commercial, Chemical	45	41	30	49	14	21
Commerical, Organic	15	14	5	8	3	4
Farm supplied	50	45	26	43	50	75
Total	110	100	61	100	67	100

Office of Foreign Agricultural Relations

Source: Based on Table 10.

Table 11. - Chemical nitrogen fertilizers consumed in Japan, 1938

Sources	Amount Consumed 1/	Nitrogen Content 2/	Equivalent in Ammonium Sulphate
	1,000 m. t.	1,000 m. t.	1,000 m. t.
Ammonium sulphate	714.0	146.0	714.0
Calcium cyanamide	211.0	46.0	224.0
Sodium nitrate	26.0	4.0	20.0
Mixed fertilizers	1,113.0	109.0	532.0
Total		305.0	1,490.0

Office of Foreign Agricultural Relations.

1/ Table
2/ Converted into N by using 20.5 percent of N as a factor.

THE DAYLIGHT SAVING TIME QUESTION

AN OPINION SURVEY

Here is your ballot - this is a sampling survey so your opinion will have considerable influence on the outcome.

- - - - - - - - - - - - - - - - - -

Does an extra hour a day of daylight time after working hours this summer seem very desireable to you?. War Department administrators would like to know how employees feel about these questions: (Check one of the following three.)

_____ Yes

1. Would you favor having the entire Washington area placed on daylight saving time for the summer months this year (May to October) by having all clocks moved 1 hour forward for this season and all work, transportation, and business schedules operating on the advanced time schedule.

or:

X Yes

2. If an area-wide official change to daylight saving time cannot be accomplished this year would you favor having all Federal Agency working hours advanced an hour earlier for this summer? (You would then come to work and leave an hour earlier by the clock than you do now and would gain an hour of daylight for yourself at the end of the day.)

or:

_____ Yes

3. Would you favor no change in hours or schedules - everybody staying on eastern standard time the year round, as we are now?

ANY COMMENTS: _____

_____

_____.

So this sampling can be checked to show that it reflects a cross section of employee opinion would you indicate one or two general facts about yourself.

A. Salary Group:

___ 1. Under $2200 per yr.
CAF2 - CAF4

✓ 2. $2300 - 3400
CAF5 - CAF8

___ 3. Over $3600
Above CAF8

B. Where do you live:

X 1. District of Columbia

___ 2. Maryland

___ 3. Arlington County

___ 4. Alexandria

___ 5. Fairfax County

___ 6. Elsewhere

C. How do you travel to work:

X Bus ____ Automobile ____ Other

D. When does your office start the working day?

___ 8:00 or earlier; ____ 8:15; ____ 8:30; ____ 8:45; X 9:00 or later.

COMPLETED BALLOTS ARE TO BE SENT TO:

COMMUNITY ACTIVITIES BRANCH
OFFICE, SECRETARY OF WAR
ROOM 1A 127, Pentagon

It may be found, upon occupation, that this quantity can be obtained from stocks stored away in Japan or from the output of factories which are left standing. If, however, the stocks found are small or non-existent, and the capacity of nitrogen fixation plants is greatly diminished from bombing, a number of alternative courses of action may be offered. The restoration of some of the destroyed plants must be attempted in spite of a time element involved, and the likelihood that a course of this kind seems to belong in the realm of long-range, rather than immediate, projects. In view of the expected short world fertilizer situation immediately after the war, the occupation authorities should make a thorough survey of the possibility of restoring Japanese production of N before requests for imports are made.

Another attempt might be made in the direction of substituting chemical fertilizers by another type, such as beancake, for example. The difficulty one encounters here is in the low nitrogen content of beancake, which contains only one-third as much nitrogen as is found in ammonium sulphate. Hence, even a partial substitution would call for a large additional volume of beancake that Manchuria could not supply. Green manures grown in Japan should be encouraged for supplying nitrogen and organic matter, especially where they do not interfere with food production.

To import ammonium sulphate would seem an expeditious course of action. It is virtually impossible at this date to suggest the volume of the required imports. The military government would have to determine that immediately upon the occupation of Japan.

It will be rather difficult to obtain nitrogenous fertilizers from abroad, even if the requested volumes are not large. No readily available stocks of nitrogenous fertilizers should be anticipated in the United States, although we are known to have a large plant capacity for the production of N for ordnance purposes. It will require considerable new construction in order to convert the Government plants to the production of N fertilizers. If, as seems unlikely, a volume of nitrogenous fertilizers should be available in the United States at the end of the war for allocation abroad, shipments to Japan will depend upon transportation, and proper claims from other areas. A considerable chemical industry was developed in Korea before the war, and the possibilities of obtaining there part of the required fertilizers should be carefully examined.

Potassium sulphate (K_2SO_4) and potassium chloride (KCL), all imported from Germany, are of relatively minor importance in Japanese agriculture. K_2SO_4 is essentially a luxury material affecting quality rather than crop yields. For all practical purposes, during the period of military occupation, the question of their availability may be omitted. More important is phosphoric acid (P_2O_5).

As in the past, practically all the phosphate rock will have to be imported if processing facilities in Japan should be found still intact. Otherwise, arrangements would have to be made for the importation of superphosphate. Normally, Japanese agriculture consumes about 120,000 metric tons of superphosphate (20.4 percent P_2O_5); a reduced volume of

70,000 tons need have no immediate detrimental effect upon yields. Repeated applications of phosphates have probably built up a supply of phosphorus in the soil, and it is believed that relatively small amounts would be sufficient for the period immediately following occupation. However, it is not clear at this time whether any superphosphate can be made available to Japan from outside sources. In that event, and if phosphate rock can be had, but cannot be processed in Japan into superphosphate, direct application of finely ground rock is recommended.

6. General recommendations. If the suggested kinds and volumes of chemical fertilizers cannot be obtained, the scarcity will call for a reduction in the indicated per acre allowances. In that event, the largest cuts should be made in P_2O_5 and K_2O, while the smallest in the nitrogenous fertilizers. In fact, because of the crucial importance of that type of fertilizer in Japanese crop production, it is highly desirable not to change the nitrogen allowance at all. Also, in determining the allowances, it is well not to overlook regional differences. They have, as a rule, a scientific basis and should, as far as possible, be met. Table 12 takes into account the special needs of the various prefectures, and while the data contained there are perhaps not uniformly correct, they may serve, nevertheless, as fair approximations of what is required.

Table 12 - Standard rates of fertilization for the principal Japanese crops by prefectures *

	Paddy Rice			Barley			Wheat		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
	pounds per acre			pounds per acre			pounds per acre		
1. Hokkaido	159	63	44	92	97	75	92	97	75
2. Aomori	115	77	78						
3. Iwate	87	77	109	78	75	87	96	87	84
4. Miyagi	79	54	70	85	75	85	86	62	94
5. Akita	70	46	83						
6. Yamagata							81	82	91
7. Fukushima	100	96	59	92	112	78	85	95	78
8. Ibaragi	88	55	62	80	77	65	60	70	53
9. Tochigi	105	76	89	124	112	88	119	111	87
10. Gumma	108	57	103	82	67	60	74	63	51
11. Saitama	107	84	90				103	82	113
12. Chiba	95	71	82	73	110	80	79	111	76
13. Tokyo-fu	80	74	79	91	83	80	91	94	80
14. Kanagawa	76	79	73	79	79	70	73	81	63
15. Niigata	86	72	82	98	74	89	88	72	85
16. Toyama	97	79	119				132	121	124
17. Ishikawa	123	73	98	103	76	84	92	71	76
18. Fukui	128	56	134				129	142	137
19. Yamanashi	99	82	104				97	83	84
20. Nagano	94	77	119				121	94	85
21. Gifu	93	86	89	56	56	55			
22. Shizuoka	91	83	73	79	89	100	106	82	99
23. Aichi	79	73	66				94	101	74
24. Miye	94	53	75				108	63	84
25. Shiga	124	70	148				112	80	134
26. Kyoto-fu	114	115	91				118	108	110
27. Osaka-fu	105	93	110	103	80	107			
28. Kyogo	74	64	70	140	110	143	121	108	140
29. Nara	132	68	117				142	88	117
30. Wayakama	98	99	101				143	110	140
31. Tottori	106	100	123				123	100	119
32. Shimane	74	37	67				95	84	118
33. Okayama	91	21	96				98	89	100
34. Hiroshima	94	84	139				106	88	155
35. Yamaguchi	98	65	69				98	69	105
36. Tokushima	91	98	102	56	98	104	81	83	87
37. Kagawa	70	72	75	155	65	78	128	64	77
38. Ehime	127	168	120	85	136	115	80	135	114
39. Kochi	116	75	122						
40. Fukuoka	81	78	95				96	82	102
41. Saga	96	78	108	114	100	102	106	85	92
42. Nagasaki	124	97	109				116	89	105
43. Kumamoto	109	68	61				128	76	60
44. Oita	92	52	86	104	70	91			
45. Miyazaki	115	77	94				85	81	67
46. Kagoshima	75	50	68				66	59	74
47. Okinawa	103	107	102						
Simple Average	97	76	93	94	88	87	101	89	95

* Report by S. Katsura for Brunner, Mond & Co. (Japan) Ltd. 15 Dec. 1930

In making fertilizers available, particularly the imported ones, the time element is of considerable importance. Customarily, there is stock-piling of chemical fertilizers between January and March, prior to the planting of the first crop in late April; a second accumulation takes place prior to the planting of the second crop, grain or rice, in July or early August, and finally a third one for the winter wheat, sometime before late October and early November. Hence, it is important to time imports with the principal planting dates.

Detailed information concerning the existing system of fertilizer distribution among Japanese farmers is not available. All one is able to gether is that in the middle of April 1944, the Japanese Fertilizer, the Organic Fertilizer Distribution, and the Great Japan Phosphorus Mining Companies were consolidated under the name of Japan Fertilizer Company.* The latter was made the sole distributor to the principal farm associations, which in turn allocate the fertilizer among the villages, and the village associations distribute it among the farmers. Whatever the system of distribution in existence, it is advisable to maintain it if upon the occupation of the country it is found workable. It may be found necessary to expand the distribution of fertilizer as an incentive to the delivery of farm products, or to contract it in order to gain compliance with the regulations as to crops to be grown and quantities to be surrendered.

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* Asahi Shimbun, May 14, 1944.

Sericulture

1. The Problem. Before the war sericulture played an important role both in the agricultural and in the national economy of Japan. Sericulture is not a primary occupation of Japanese farmers. In 1938, for instance, of the total of 1,618,000 families only 29,000 engaged in this work exclusively and to only 221,000 was it the chief occupation. For the vast majority it is a side line, though a very important one. In 1940, the value of cocoons constituted 14 percent of the total value of all agricultural products (19 percent in 1929). From the point of view of marketability and as a source of cash income, cocoons occupied a premier position; the entire crop entered the market and it accounted for approximately one-fourth of the cash value of agricultural products.

Japanese sericulture for more than a decade before the war was a "problem" industry, chiefly because Japan exported most of its silk to one country, the United States. In 1929, the latter received 97 percent of all Japanese silk exports, the lowest figure in any year during the period of 1929-1939 being 80 percent. The fortunes of the farmers were dependent, therefore, upon the ability to dispose of the output at remunerative prices in the American market. It wasn't always possible to do that before the war and it will be much more difficult to do so after the war. On the agricultural side this creates a problem of what to do with the mulberry acreage, geared as it is to a silk output for which there is likely to be a limited market after the war. From the point of view of Japan's economy as a whole, a sharp reduction in the volume of pre-war silk exports will undoubtedly create another serious problem.

Before the war Japan generally had an adverse balance of merchandise trade and service items combined. In order to reduce this adverse balance, or ever to bring about a favorable one, Japan had endeavored to receive for its exports a maximum net amount of foreign exchange. Silk was the top-ranking item in this respect in Japan's export trade. Raw silk accounted for as much as 40 percent of Japan's total exports in the early 1920's. The figure was greatly reduced in subsequent years, but during 1935-39, raw silk exports averaged 21 percent of total exports to foreign-exchange countries. In other words, silk exports have continued to remain Japan's principal source of foreign exchange.

2. The Situation. The United States' outlet for Japanese silk, and for silk in general, has been shrinking, as evidenced by the figures in Table 13. The main cause underlying this trend is the successful competition of rayon, and more recently of nylon (Handbook, pp. 129-133). Before the late 1930's, there had always been a reasonable assurance that a slump in silk exports and in prices would be corrected when economic activity in the United States rose. The years 1939 and 1940 demonstrated, however, that, owing to the competition of other fibers, improved economic conditions in the United States do not necessarily go hand-in-hand with larger takings of silk even in reasonable prices. In 1939 silk accounted for only 10 percent of the combined world consumption of rayon and silk as against 40 percent in 1929. The consumption of silk in hosiery manufacture has increased, but not in sufficient quantity to offset the loss in woven goods. But by 1940 even the remaining stronghold of silk was being undermined by nylon.

Developments in the United States since 1941 point to such strong competition from nylon and rayon, that silk will be confined to a small market only. The estimates of the post-war consumption of silk in this country range from 8 to not more than 20 million pounds per year compared with an annual pre-war figure of about 60 million pounds. Assuming that after the war the United States will once again depend upon Japan for 80 percent of its silk consumption, even the maximum volume will probably not exceed 16 million pounds. Furthermore, Japan's future consumption of silk can hardly be maintained at the abnormal war level, which is probably in the neighborhood of 50 million pounds.

3. Recommendations. Before considering any action with respect to sericulture on the part of the occupation authorities, it seems desirable to review the Japanese Government's approach to the problem immediately before and during the war. It consists in converting a considerable part of the mulberry acreage to food crops. Modifications in this policy will probably be necessary, depending, first, upon our specific needs for silk at the time or shortly after the occupation of Japan, and, second, upon Japan's silk requirements in lieu of the possible temporary lack of such fibers as cotton and wool. On the whole, the policy may well be maintained despite the fact that cash income of many farmers will be curtailed.

The basis upon which this suggestion rests is the need to reduce raw silk production from approximately 95 million pounds to 50 or 60 million pounds. If the yields and labor required per unit of land should be roughly the same in post-war as in pre-war times, the indicated curtailment of silk production calls for a reduction of acreage from 1,400,000 to 700,000 or 800,000 acres, and the number of farm families engaged in raising cocoons from 1.6 million to less than 900,000. (Table 14).

Table 13 - Japanese exports of raw silk, 1929-40

Year	Quantity	Value		Percentage of Quantity to -			
				United States	England	France	Others
	Million pounds	Million yen	Million dollars	Percent	Percent	Percent	Percent
1929	77	781	360	96.7	0.5	1.7	1.1
1930	63	417	206	95.7	0.7	1.9	1.7
1931	74	355	173	96.1	1.3	1.4	1.2
1932	73	382	107	94.2	2.4	1.9	1.5
1933	63	391	100	91.0	3.7	3.9	1.4
1934	67	287	83	83.5	5.1	7.0	4.4
1935	73	387	111	84.3	5.1	6.3	4.3
1936	67	393	114	85.0	5.7	5.5	3.8
1937	63	407	117	80.3	7.3	6.4	6.0
1938	63	364	104	82.4	7.0	6.6	4.0
1939	51	507	132	85.9	7.1	3.6	3.4

Office of Foreign Agricultural Relations.
Compiled from official sources.

Table 14 - Sericulturists, production and mulberry acreage (specified years)

Year	Families raising cocoons	Cocoons produced	Mulberry acreage
	1,000	1,000 pounds	1,000 acres
1929	2,217	844	1,505
1939	1,651	751	1,305
1940	1,648	724	1,308
1941	1,224	573	-
1942	1,120 1/	489 1/	-
1943	1,114 1/	453 1/	951 2/
1944	995 1/	374 1/	720 2/

Office of Foreign Agricultural Relations.
Compiled from official sources.

1/ Radio intercepts.
2/ Estimated.

Wartime development in the sericulture industry have brought about significant curtailment. As of 1944, the number of producers is given as 995,000, and production of cocoons as 374 million pounds, or a volume large enough to produce 50 million pounds of raw silk. Not all of the curtailed mulberry area, which may be estimated at about 600,000 acres, has been put to crops. Many farmers abandoned their mulberry patches for the war industries, while some of the acreage could not be put to food crops because of the nature of the soils; however, most of the curtailed acreage was not abandoned, but planted to wheat, barley and other foods that can be grown on upland, unirrigated soils of Japan. Since the mulberry soils are not highly productive unless well fertilized, the yields of food crops are probably low now; with fertilizers more abundant after the war, yields will probably improve.

Much of this conversion to food crops has already been accomplished. In the face of the continued food shortage in Japan from domestic resources after the war, coupled with the probable difficulty of paying for imported food, the increased volume of food production from the mulberry acreage will be a welcome addition to the total food supply. More specifically, the nine prefectures, Nagano, Gifu, Gumma, Yamanashi, Fukushima, Yamagata, Saitama, Aichi, and Ibaraki, which accounted for 50 percent of the total mulberry acreage, are not surplus food producers. Any increase in food production even if it is not rice would tend to ease the food situation.

The relatively high food prices which are likely to prevail in Japan immediately after the war would insure the farmers a relatively good income from the converted mulberry acreage. To be sure, the income might not be as large as that derived from cocoon-raising, but it is clear that the decrease in the volume of cocoon-raising will not spell a total loss as far as the sericulturists are concerned.

The above suggestion is derived mainly from the assumption of a curtailed foreign silk market. It is possible, however, to envision a post-war situation in which the export market for Japanese silk will be larger than the one now anticipated in the United States trade circles, and that much of the expanded Japanese wartime consumption of silk might be carried over into the post-war period. Silk requirements might then rise to about 70 million pounds.

It is doubtful if Japan will have then the required area of 1,000,000 acres under mulberries to produce 70 million pounds of silk. And it may not be desirable, from the point of view of the occupation authorities, to have the wartime food acreage reduced to any extent for the sake of cocoon-raising, unless imports of food into Japan should present no problem. This is a situation that can be hardly anticipated. For this reason the task of producing this much silk might be difficult to accomplish in the year or two following Japan's defeat. It will be possible, however, to raise a volume of cocoons from which sixty million pounds of raw silk could be produced.

The existing mulberry acreage, in addition to the restored abandoned groves, could possibly yield a supply of approximately 425 million pounds of cocoons from about 800,000 acres. Given the manufacturing facilities, this would be sufficient for the production of sixty or more million pounds. The limiting factor in raising cocoons might be fertilizers. The latter is an important element in production, since fertilizers account for one-fifth of the cost of raising cocoons. Fertilizers for the mulberry acreage are part of the general problem of the fertilizer supply for crop production in the post-war Japan. Whether fertilizer should be allocated to the cocoon raisers will have to be decided by the occupation authorities on the spot, depending upon the total available supply, and the respective needs for food and silk.

If, contrary to present expectations, the situation should arise where the volume of silk production in Japan was to reach 70 million pounds or more, there will probably come to the fore the old problems of controlling both production and distribution. In that event, the experience of Japan in those fields, which is of long standing, might be valuable. It was all summed up, as it were, in the establishment of the Japan Raw Silk Control Company (March 12,1941), a semi-private organization operating under government supervision.

The company was to have provided a unified control of all the main branches of the industry - from silkworm eggs on through the distribution of silk. Specifically, it was within the province of this organization to determine the purchasing and selling prices of silkworm eggs, cocoons, and raw silk (subject to the approval of the Minister of Agriculture), taking into consideration the total demand for raw silk, the prices of all commodities, and other pertinent economic factors, that affect the cost of production. It was given the exclusive right of purchasing and distributing silkworm eggs and cocoons. With regard to raw silk, a double price system was adopted; one for domestic consumption, and another for exported silk.

The company did not engage in exporting silk; that function remained with the exporters who purchased the silk from the company. On the other hand, raw silk for domestic consumption was sold directly by the company. The Government, however, could exercise, through the company, such control over exports as it thought necessary. The Government also had the right to purchase from and sell to the company certain quantities of silk when such operations were deemed helpful in adjusting prices.

In addition to the establishment of the control company, the Government organized also the Raw Silk Committee Conference, made up of Government officials and representatives of every branch of the industry. The main business of the Conference was to advise the Government on matters pertaining to the industry, and the decisions thus reached by the Government were to be carried out by the Japan Raw Silk Company.

No information on the functions of those organizations in wartime is available. But whatever changes they may have undergone, the occupation authorities could, perhaps, profitably enlist for their purposes the skill and experience of some of the personnel of these organizations.

APPENDIX A

Perfectural Agricultural Experiment Station

Prefectures	Name of Agricultural Experiment Station	Mura, cho, machi or Locality	Shi or City	Gun or District	Fu, ken, do or Prefecture
Hokkaido	Hokkaido Noji Shikenjo	Kotoni		Ishikari - gun	Hokkaido
Aomori	Aomori Kenritsu Noji Shikenjo	Kuroishi - cho		Minamitsugaru-gun	Aomori-ken
Iwate	Iwate Kenritsu Noji Shikenjo	Motomiya		Iwate - gun	Iwate-ken
Miyagi	Miyagi Kenritsu Noji Shikenjo			Natori - gun	Miyagi-ken
Akita	Akita Kenritsu Noji Shikenjo			Kawabe - gun	Akita-ken
Yamagata	Yamagata Kenritsu Noji Shikenjo	Mikka - machi	Yamagata-shi		Yamagata-ken
Fukushima	Fukushima Kenritsu Noji Shikenjo			Asaka - gun	Fukushima-ken
Ibaraki	Ibaraki Kenritsu Noji Shikenjo	Sakado - mura		Higashiibaraki-gun	Ibaraki-ken
Tochigi	Tochigi Kenritsu Noji Shikenjo	Imaidzumi - cho			Tochigi-ken
Gumma	Gumma Kenritsu Noji Shikenjo		Maebashi-shi		Gumma-ken
Saitama	Saitama Kenritsu Noji Shikenjo	Tamai - mura		Osato - gun	Saitama-ken
Chiba	Chiba Kenritsu Noji Shikenjo	Nakareyama-mura		Higashikatsushika-gun	Chiba-ken
Tokyo	Tokyo Furitsu Noji Shikenjo	Nakano - cho	Tokyo		Tokyo-fu
Kanagawa	Kanagawa Kenritsu Noji Shikenjo	Ofuna		Kamakura - gun	Kanagawa-ken
Niigata	Niigata Kenritsu Noji Shikenjo	Kesajiro	Nagaoka -shi		Niigata-ken
Toyama 1/					
Ishikawa	Ishikawa Kenritsu Noji Shikenjo			Ishikawa - gun	Ishikawa-ken

CONFIDENTIAL

Prefecture	Name of Agricultural Experiment Station	Mura, cho, machi or Locality	Shi or City	Gun or District	Fu, ken, do, or Prefecture
Fukui	Fukui-ken Noji Shikenjo		Fukui - shi		Fukui - ken
Yamanashi	Yamanashi Kenritsu Noji Shikenjo	Ise-cho	Kofu - shi		Yamanashi - ken
Nagano	Nagano Kenritsu Noji Shikenjo				Nagano - ken
Gifu	Gifu Imperial Agricultural College	Kano - mura		Inaba - gun	Gifu - ken
Shizuoka	Shizuoka Kenritsu Noji Shikenjo	Toyoda - mura		Shida - gun	Shizuoka - ken
Aichi	Aichi Kenritsu Noji Shikenjo			Nishikasugai - gun	Aichi - ken
Miye	Miye Kenritsu Nojo Shikenjo		Tsu - shi		Miye - ken
Shiga	Shiga Kenritsu Noji Shikenjo			Shiga - gun	Shiga - ken
Kyoto 1/					
Osaka	Osaka Furitsu Noji Shikenjo		Sakai		Osaka - fu
Hyogo	Hyogo Kenritsu Noji Shikenjo			Akashi - gun	Hyogo-ken
Nara	Nara Kenritsu Noji Shikenjo	Abarazaka- cho	Nara - shi		Nara - ken
Wakayama	Wakayama Kenritsu Noji Shikenjo			Kaiso - gun	Wakayama-ken
Tottori	Tottori Kenritsu Noji Shikenjo			Iwami - gun	Tottori - ken
Shimane	Shimane Kenritsu Noji Shikenjo	En' ya - mura		Hinokawa - gun	Shimane - ken
Okayama	Okayama Kenritsu Noji Shikenjo	Takamatsu-mura		Kibi - gun	Okayama - ken
Hiroshima	Hiroshima Kenritsu Noji Shikenjo	Saijo - cho		Kamo - gun	Hiroshima-ken
Yamaguchi	Yamaguchi Kenritsu Noji Shikenjo	Ouchi - mura		Yoshiki - gun	Yamaguchi-ken

Prefectures	Name of Agricultural Experiment Station	Mura, cho, machi or Locality	Shi or City	Gun or District	Fu, Ken, do, or Prefecture
Tokushima	Tokushima Kenritsu Noji Shikenjo	Kamona - mura		Myoto - gun	Tokushima-ken
Kagawa	Kagawa Kenritsu Noji Shikenjo			Kagawa - gun	Kagawa-ken
Ehime	Ehime Kenritsu Noji Shikenjo			Onsen - gun	Ehime-ken
Kochi	Kochi Kenritsu Noji Shikenjo	Nagaoka-mura		Nagaoka-gun	Kochi-ken
Fukuoka 1/					
Saga 1/					
Nagasaki	Nagasaki Kenritsu Noji Shikenjo		Nagasaki-shi		Nagasaki-ken
Kumamoto	Kumamoto Kenritsu Noji Shikenjo			Hotaku-gun	Kumamoto-ken
Oita	Oita Kenritsu Noji Shikenjo				Oita-ken
Miyazaki	Miyazaki Kenritsu Noji Shikenjo	Akae - mura		Miyazaki-gun	Miyazaki-ken
Kagoshima	Kagoshima Imperial University		Kagoshima		Kagoshima-ken
Okinawa	Okinawa-Ken Togyo Shikenjo	Nishihara-mura		Nakagami-gun	Okinawa-ken

1/ The prefectures have stations, but locations not indicated.

CONFIDENTIAL

Federal Stations

Federal Agricultural Experiment Station at Konosu, Kitaadachi - gun, Saitama Prefecture.
Federal Agricultural Experiment Station at Senlioku - gun, Akita Prefecture.
" " " " " Nishigahara, Tokyo, with two sub-stations in Konosu and Omagari.
Federal Horticultural Experiment Station at Okitsu, Shizuoka Prefecture.
Federal Tea Industry Experiment Station at Kanaya, Shizuoka Prefecture.
Federal Livestock Experiment Station at Miyako-mura, Chiba Prefecture.
Federal Stockyard in Toyohira-machi, Hokkaido.
Federal Veterinary Research Station at Nishigahara, Tokyo.
Federal Poultry Farms at Aomori, Omiya, Harima, Okazaki, and Higo.
Federal Sericultural Experiment Station at Suginamimura, near Tokyo.
Federal Silk Conditioning Laboratory in Yokohama.
Federal Horse Breeding Station, two central, fifteen local.

Special Stations

Agricultural Experiment Station of Okinawa (Lutchu) with sugar sub-station.
Prefectural tea industry experiment stations (Saitama, Kumamoto, and Kyoto)..3
Prefectural apple experiment station (Aomori).....1
Prefectural sugar experiment station (Kagoshima) 1
Prefectural sericultural experiment stations (with 25 sub-stations) 48
Prefectural livestock farms 59
Prefectural sheep farms 5
Prefectural grain inspection stations 111
Prefectural sericultural inspection stations 45
Prefectural silk cocoon inspection stations 35

APPENDIX B

AGRICULTURE AND COMMERCE MINISTRY 1/

Nosho-sho

MINISTER'S SECRETARIAT - Daijin-kambo '

Secretariat Section - Nisho-ka
Accounts Section - Kaikei-ka '
Statistics Section - Tokei-ka
Documents Section - Bunsho-ka

GENERAL AFFAIRS BUREAU - Somu-kyoku 0

General Affairs Section - Somu-ka
Adjustment Section - Seibi-ka
Resources Mobilization Section - Busshi Doin-ka
Associations Section - Dantai-ka
Funds Section - Shizai-ka
Oils & Fats Section - Yushi-ka
Planning Section - Kikaku-ka

AGRICULTURAL ADMINISTRATION BUREAU ' - Nosei-kyoku

Agricultural Administration Section - Nosei-ka
Management Section - Keiei-ka
Agricultural Products Section - Nosan-ka
Agricultural Insurance Section - Nogyo Noken-ka
Land Cultivation Section - Kochi-ka
Animal Products - Chikusan-ka
Fertilizer Section - Hiryo-ka
Feeds Section - Shiryo-ka

RESOURCES BUREAU - Shizai Kyoku
(FCC, March 10, 1945)

RECRUITMENT BUREAU - Yoin Kyoku
(FCC, March 10, 1945)

Key to Symbols
_____Drawn from the Shokuin Roku, June 1943
- - -Drawn from the Asahi Nenkan, November 1943
* Existence reported (chiefly broadcast sources) July-Dec. 1943
' " " " " " Jan.-June 1944
0 " " " " " July-Dec. 1944

Figures in parentheses following names of bureaus and sections indicate rank of chief where known.

1/ Compiled by OSS, Research and Analysis Branch

TEXTILE BUREAU -- Sen'i-kyoku

Cotton Manufacturing Section -- Mengyo-ka
Silks & Woolens Section -- Kemmo-ka
Synthetic Fibre Section -- Jinzo Sen'i-ka
Planning Section -- Keikaku-ka
Sericultural Section -- Yozan-ka

FORESTRY BUREAU 0 -- Sanrin-kyoku

Planning Section -- Kikaku-ka
Forestry Administration Section -- Rinsei-ka
Timber Section -- Mokuzai-ka
Fuel Section -- Nenryo-ka
Afforestation Section -- Zorin-ka
Operations Section -- Sagyo-ka

FRUITS BUREAU
(FCC RR 28 June 1944)

FISHERIES BUREAU -- Suisan-kyoku

Fisheries Administration Section -- Gyosei-ka
Marine Section -- Kaiyo-ka
Installations & Equipment Section -- Shisetsu-ka
Fisheries Section -- Suisan-ka

HORSE ADMINISTATION BUREAU -- Basei-kyoku

General Affairs Division -- Somu-bu
Horse Breeding Division -- Basan-bu
Resources Division -- Shigen-bu
Business Affairs Section 0 -- (Probably Somu-bu or
(FCC RR #56 2 Oct. 1944 under Somu-bu)

COMMODITIES FOR LIVING BUREAU ' -- Seikatsu Busshi-kyoku

Agricultural Food Products Sect. -- Nosan Shokuhin-ka
Animal Food Products Section -- Chikusan Shokuhin-ka
Manufactured Foods Section -- Kogyo Shokuhin-ka
Manufactured Goods Section -- Kogyohin-ka

CONSUMERS COMMODITIES BUREAU
(FCC. RR #51 - 4 Aug. 1944))
) Possibly same as Commodities
RETAIL BUREAU) for Living Bureau
(FCC. RR #41 - 12 Oct. 1943))

FOOD CONTROL BUREAU -- Shokuryo Kanri-kyoku

First Division -- Dai Ichi-bu
Second Division -- Dai Ni-bu

CENTRAL HQ. INCREASED PRODUCTION WARTIME FOODS -- Shokuryo Kokubodan Chuo Hombu

APPENDIX C

Distribution of Vegetables, Fruit, and Fish 1/

The Japanese Cabinet approves the plans for strengthening the rationing /distribution/ administration of vegetables, fruit and sea food of the Ministry of Agriculture and Commerce. The important points of the "Item Concerning the Adjustment and Strengthening of Fresh Food Shipping and Distribution Organization" announced by the Information Bureau are:

1. Local authorities will be responsible for the insurance of fresh foods in the same shipping amount as for the principal foods, such as rice, wheat, taro, etc.

2. Wholesale markets and final distribution organizations will be under government control. Transportation organizations directly under shipping organizations will be strengthened.

3. Inspection and investigation system will be established to prevent distribution violations.

The outline of the details of the Item are as follows:

1. "Responsibility system" of local authorities for planned shipping of fresh foods will be strengthened.

2. To ease the present transportation situation, the use of motor sailboats and small scale land transportation will be strengthened.

3. Wholesale markets will be more strongly controlled by the Government.

4. To simplify distribution procedure the coordination between final distribution organizations and street and neighborhood associations will be strengthened.

1/ Translation of a statement which appeared in Yomiuri Hochi (Tokyo), April 15, 1944.

Measures:

A. Fresh vegetables and fruits:

1. The following measures are decided concerning shipping control.

a. Plan for shipping fresh vegetables and fruits (especially vegetables to big consuming places will be decided by the Minister of Agriculture and Commerce and instructions will be given to local authorities.

b. Local authorities will instruct local agricultural associations on the execution of the plans.

c. Under the direction of the Minister of Agriculture and Commerce, the Central Agricultural Association will keep in close touch with the local agricultural associations.

d. Chairmen of local administrative conferences may make adjustments concerning shipping.

2. The following measures are decided concerning distribution organizations in big consuming places:

a. In accordance with the new Control Company Order, the following distribution organizations are established. Their structure is simplified, and their function is made thorough.

1) Existing organizations of investors /dealers/ related to distribution and local public organizations will be utilized.

2) Rights through investment in existing wholesale organizations will be reduced.

3) Establishments by control organizations:

a) Special transportation. Equipment for storage and processing will be established.

b) Establishment of market facilities will be increased.

b. The following measures are decided for the business administration of receiving and distributing organizations:

1) Management for receiving shipments will be adjusted and rationalized, and the burden of those sending out shipment will be lightened.

2) Supervising authorities and committees concerned will decide on just prices.

3) Local authorities and control organizations will assist public organizations in executing their duties.

3. The following measures are decided for the final distribution organizations:

a. Close coordination among receiving, distributing, and control organizations is being considered with regard to combining the operations of distributors.

b. As far as possible, combined distribution will be carried out. The establishment of distribution centers for vegetables and fish by street and neighborhood associations is being considered.

c. With regard to the improvement of distribution method, more adaptable use of labor will be worked out, and important personnel for distribution will be insured.

d. Related authorities, receiving, distributing and control organizations, and other organizations concerned, will do their best in directing and encouraging the final distribution organizations.

4. Shipping stations in producing areas will be increased with the cooperation of local public organizations.

B. Fish:

1. The following measures are decided concerning shipping:

a. Method of shipping control is changed:

1) In localities designated by the Minister of Agriculture and Commerce, instructions for shipping will be given to local authorities after they are decided by the Minister. In the six big cities, when necessary, the Minister will give instructions to distribution organizations through local authorities.

2) With regard to the application of shipping plans by local authorities, with the exception of 4), local marine products enterprise associations will direct shipping organizations in their affairs according to actual conditions.

3) Under the direction of the Minister of Agriculture and Commerce, the Central Marine Products Enterprise Association will closely cooperate with local authorities and local marine products enterprise associations in carrying out shipping measures.

4) In the sea on the northern part of the Empire shipping control organizations will be organized by the Imperial Marine Product Control Corporation and the local marine products enterprise associations to control fishing.

b. Priority distribution of heavy oil and other essential resources necessary for shipping is under consideration.

2. The following measures are decided concerning distribution organizations in big consuming places:

a. Shipping organizations will be established in the six big cities (including their vicinities) and North Kyushu. Local administrative conferences will assist these organizations in adjusting their relationship.

b. In accordance with the new Control Company Order, the following distribution organizations are established. Their structure is simplified, and their function is made thorough.

1) Existing organizations of investors /dealers/ related to distribution and local public organizations will be utilized.

2) Rights through investment in existing wholesale organizations will be reduced.

3) Control organizations will handle in a combined way fresh fish, salted fish, and frozen marine products.

4) Control organizations will decide on the following measures:

a) Special transportation: Equipment for storage, processing and making artificial ice will be established.

5) Management of small-scale fishing and small-scale transportation will be centralized.

c. With regard to business administration and receiving and distributing organizations the following measures are decided:

1) Management of receiving shipments will be adjusted and rationalized, and the burden of those sending out shipments will be lightened.

2) Due to the nature of products and their seasons, transactions at producing areas and storage in producing areas are under consideration.

3) Supervising authorities and committees concerned will decide on just prices.

4) Local authorities and control organizations will assist public organizations to execute their duties.

3. Measures for the final fish distribution organizations, are the same as those for vegetables.

APPENDIX D

JAPANESE WEIGHTS AND MEASURES

(a) Common Units of Measurement in Japan with United States Equivalents 1/

Japanese Unit	Type of Measure	Metric	Equivalent	United States	
		Quantity	Unit	Quantity	Unit
1 cho	area	0.9917	hectare (ha.)	2.4505	acres
1 koku (dry)	capacity	1.8039	hectoliters (hl.)	5.119	bushels
1 koku (liquid)	-	1.8039	hectoliters (hl.)	47.655	gallons
1 kin	weight	0.60	kilogram (kg.)	1.3228	pounds
1 kwan	-	3.75	kilogram	8.2672	pounds
1 picul	-	0.60	quintals, metric (m.q.)	132.276	pounds

(b) Conversion Factors for Principal Crops of Japan 2/

One koku of:	Equivalent Unit: Quintals	Equivalent Unit: Bushels
Rough rice	1.025	4.960
Barley (covered)	1.0875	4.995
Barley (naked)	1.3875	5.098
Oats	0.7875	5.425
Buckwheat	1.125	5.167
Wheat	1.372	5.043
Foxtail millet	1.275	5.019
Soybeans	1.29	4.739
Broad beans	1.26	4.960
Kidney beans	1.35	4.960
Peas	1.35	4.960

1/ Gries, C.G. Foreign Weights and Measures with Factors for Conversion to United States Units, Office of Foreign Agri. Rel., U. S. Dept. of Agr., 1944.

2/ Recommended in 1936 by Chief of the Section of Plant Industry of the Ministry of Agriculture and Industry of Japan.

EQUIVALENTS OF JAPANESE CAPACITY MEASURES

Commodity	lbs 1/ /bu	lbs 5/ /koku	kg 8/ /koku	koku /mt
Brown rice	63 2/	322.423	146.2499	6.838
Wheat (and naked barley)	60	307.141	139.3182	7.178
Barley	48	245.713	111.4547	8.972
Corn	56	286.665	130.0304	7.691
Millet	50 3/	255.951	116.0986	8.613
Soybeans	60	307.141	139.3182	7.178
Sweet potatoes	55 4/	281.546 6/	127.7084	7.830
White potatoes	60	307.141 6/	139.3182	7.178
Fish	-	330.693 7/	150.0000	6.667

1/ The approximate weight in lbs. per bushel is based on the "Agricultural Statistics," 1939, published by the U. S. Department of Agriculture, except brown rice and fish.

2/ The equivalent weight of brown rice is converted from 1 koku to 146.2499 kg.

3/ Millet is approximately 48 to 50 lbs. to a bushel. (In this table it is calculated on 50 lbs. basis.)

4/ Sweet potatoes are based on the weight when harvested; while on the market the weight may be less.

5/ Koku is a Japanese capacity measure for grains and rarely applied to potatoes and fish. One koku of grain is equivalent to 5.11902 U. S. bushels (dry).

6/ In Japanese statistics, potatoes are usually given in terms of weight unit of kan which is equivalent to 3.75 kg. or 8.267 lbs.

7/ Fish is usually given in weight unit of kan, except figures on the catch in Russian water. In which case, the capacity unit, koku is used. One koku of fish is equivalent to 40 kan or 150 kg.

8/ Kilograms are converted from pounds at the rate of 2.2046 lbs. to one kg.

APPENDIX E

Table 15

CONTROL MEASURES FOR INSECT PESTS 1/ 2/

Crop Plant	Insect Pest	Control Measures
Rice	1. Stem borer Chilo simplex, and others	(a) Tobacco dust combined with 5% sulfur, 15% lime. (b) Flooding young plants to submerge for 24 hrs. (c) Hand collection of egg masses from foliage. (d) Destruction of infested plants.
	2. Leaf-hoppers Delphaz furcifera Liburnia oryzae Nephotettix apicalis var. cincticeps.	(a) Hand collection of hoppers with nets. (b) Kerosene applied to flooded field at rate of 1 gal. per 1200 sq.yds. Bugs shaken from plants into oil film on water.
Soybeans	1. Pod-borer Laspeyresia glycinivorella	(a) Early maturing varieties (b) Fall plowing to kill hibernating larvae in soil.
Stored grain and products	1. Granary weevil and many other insects	(a) Prevention of initial infestation of storage rooms by elimination of refuse. Heat to 120-150°F. for several hrs. (b) Carbon bisulfide fumigation for 48 hrs. with 4 lbs. liquid per 1,000 cu.ft. Liquid inflammable. (c) Chloropicrin fumigation for 72-96 hrs. with 1 lb. liquid per 1,000 cu.ft. Non-inflammable.

1/ Table prepared by Warren H.Leonard, Captain, CAC, from material supplied by C.P.Clausen, in Charge, Control Investigations, Bur. Ent. and Plant Quarantine, U.S.Dept. Agric. For a detailed discussion of this question, see Supplement to the Handbook on Agriculture.

2/ Where possible, an entomologist should be consulted for details on insect control.

Table 15

Crop Plant	Insect Pest	Control Measures
Vegetable Crops Cabbage Radishes Turnips Carrots	1. Pieris rapae also Evergestis extimalis Plutella maculipennis	(a) Collection of larvae by hand. (b) Dusting plants with calcium arsenate or cryolite (2 lbs. cryolite in 1 lb. talc or other diluent) before edible portions formed. (c) After head formation, dust with pyrethrum (1 lb. ground pyrethrum flowers in 3 lbs. talc or tabacco dust). When Plutella is present it will be necessary to add an equal amount of nicotine mixture. (1 oz. 40% nicotine sulfate in 1 lb. lime).
	2. Aphids	(a) Apply nicotine spray (1 oz. 40% nicotine sulfate, 2 oz. soap, 1.5 gal.water). (b) Spraying with plain soap mixture (2 oz. laundry soap to 1 gal. water). Fairly effective
Sweet Potatoes	1. Ephesia dissimilis	(a) Winter plowing to destroy hibernating pupae. (b) Heavy infestations controlled with lead arsenate spray applied frequently.
	2. Leaf beetle chrysochus chinensis	Winter plowing to destroy hibernating insects in soil.
Irish Potatoes	1. Beetles Epilachna nipponica and other of same genus	(a) Spraying with lead arsenate, nicotine sulfate, or dusting with pyrethrum. (b) Cryolite spray (4 lbs. in 50 gal. water) will give good control.
Apples and pears	Carposina sasaki Also Argyresthis conjugella	Enclose fruits in paper bags 1/

1/ Chemical control impracticable because of cost and lack of power equipment in Japan.

Table 15

Crop Plant	Insect Pest	Control Measures
Sand pears and peaches	Oriental Fruit Moths Grapholitha molesta	Enclose fruits in paper bags.
Pears	Borer Nephopteryx piriovella	(a) Bagging fruit as early as possible. (b) Spraying with lead arsenate or DDT in early spring would be effective.
Citrus Fruits	1. Yanone scale Prontaspis yanonensis	Fumigation with hydrocyanic acid gas. Dosage 6.5 oz. calcium cyanimide per 1,000 cu.ft. of tent space and for 30 minutes.
	2. Ruby scale Cirophastis rubens	Same as for Yanone scale.

351 X 97 x (100-96) = 327

351 / 9 / 3159

351 / 97 / 2457 / 3159 / 3407 / 96 / 2380 / 3696 / 294

APPENDIX F

PROXIMATE COMPOSITION OF ASIATIC FOODS a/

Per 100 Grams

I. STARCHY FOODS	Calories	Protein	Fat	Carbo-hydrates	Rice Equivalence 1/
		%	%	%	
A. CEREALS					
Barley, pearled	357	8.7	1.0	78.3	1
Barley, whole	361	12.8	2.1	72.8	1
Buckwheat, lightly milled .. (Fagopyrum esculentum Moench)	354	6.3	1.1	79.7	1
Flour, wheat - 70% extraction	351	10.0	1.0	75.5	1
85% extraction	346	11.0	1.6	72.0	1
100% extraction	316	11.5	2.4	62.0	1
Maize (Corn) ..... (Zen mays Linn.) ...	349	10.0	4.5	67.0	1
Millets, average	340 - 365	10.0 - 11.0	4.0 - 5.0	65.0 - 69.0	1
Rice, brown	356	7.5	1.7	77.7	1
Rice, flour	352	7.4	0.5	79.5	1
Rice, polished (Cryza sativa Linn.).....	351	7.6	0.3	79.4	1
Rice, polishings	393	11.6	10.1	64.0	1
Sorghum (Kaffircorn, guinescorn)	356	10.4	3.4	70.9	1
B. ROOT VEGETABLES					
Cassava (manioc) flour	314	1.5	0	77.0	1
Fresh	131	0.7	0	32.0	.5
Tapioca	346	0.5	0	86.0	1
Potato, Irish (Solanum Tuberosum)	83	2.0	0	18.1	.25
Potato, sweet (Ipomosa batates (Linn.) Lam.....	121	2.0	1	26.0	.3
Sago, flour	341	0.3	0	85.0	1
Taro (Colocasia & Alocasia sapp.)	88	2.0	0	20.0	.25
Yam (Dicscorea sapp.)	100	2.0	0	23.0	.3

a/ Prepared in Subsistence Division, Office of the Quartermaster General,
Based on: National Research Council Tables of Food Composition, 1944
Human Nutrition Research Unit, 1944
Analysis of Far Eastern Foods

1/ Equivalence based on caloric value.

II. SOYBEANS AND OTHER PROTEIN VEGETABLES	Calories	Protein	Fat	Carbohydrates	Soybean Equivalence 2/
		%	%	%	
A. SOYBEANS and PRODUCTS					
(Glycine max. (Linn.)merr.)dry	350	34.9	18.1	12.0	1
" , fresh . . .	132	12.5	6.5	6.0	.3
Soybean curd.	81	7.5	4.2	3.4	.2
Soybean milk.	35	3.4	1.5	2.0	.1
Soybean meal (press cake) . .	278	41.8	5.7	15.0	1.2
Soybean sprouts	75	8.5	1.8	6.3	.2
Soy sauce	53	2.0	1.0	9.0	-
B. OTHER PULSES					
Broadbeans (Vicia faba Linn.)	347	25.1	1.8	57.7	.7
Butter beans.		Same as	Lima	beans	
Chick peas (Cicer Arietinum . (Linn.)	369	20.8	4.7	60.9	.6
Cowpeas (Vigna unguiculata . (Linn.) Walp), fresh . . .	134	9.4	0.6	22.7	.3
" , dry	351	22.9	1.4	61.6	.6
Curry bean		Same as	Lima	bean	
Fava (horse bean) (Vicia . . faba Linn.)		Same as	Broad	bean	
Groundnut (peanut, monkey . . nut) (Arachis hypogaea . . Linn.)	555	23.0	47.0	10.0	.7
Lima bean (Phaseolus lunatua Linn.)	341	20.7	1.3	61.6	.6
Madagascar bean		Same as	Lima	bean	
Mung bean (Phaseolus mungo Linn.)	349	24.4	1.4	59.7	.7
Navy bean (Phaseolus vulgaris Linn.)	350	22.0	1.5	62.1	.6
Pea beans (Phaseolus vulgaris Linn.)		Same as	Navy	bean	
Pinto bean		Same as	Navy	bean	
Red Kidney bean		Same as	Navy	bean	

2/ Equivalence based on protein content.

III. FISH, MEAT AND EGGS	Calories	Protein	Fat	Carbo-hydrates	Fish, Dried Equivalence 3/
		%	%	%	
A. FISH					
Fish, canned (representative of sardine, mackerel, tuna and salman)	207	22.5	12.8	0.3	.3
Fish, dried, Cod	352	81.8	2.8	0	1
Fish, fresh, high fat 4/ A.P.	85	12.0	4.1	0	.2
Fish, fresh, med. fat 5/ A.P.	46	8.5	1.3	0	.1
Fish, fresh, low fat 6/ A.P.	46	10.7	0.4	0	.2
Fish, hard smoked, Herring type (34. 6% water)	290	36.9	15.8	0	.4
Fish, smoke dried, Mackerel type (59.4% water)	212	23.8	13.0	0	.3
Lobster, fresh, whole, A.P.	30	5.8	.7	.2	.1
" , E.P.	84	16.2	1.9	.5	.2
Shrimp, cooked, canned, E.P.	82	17.8	.8	.8	.2
B. MEAT					
Meat, Canned (Beef, canned, corned, med. fat) 7/	209	25.3	12.0	0	.3
Beef, fresh carcass common grade, A.P. 7/	163	15.2	11.0	0	.2
Chicken, Fr., roasters, dressed, A.P. 7/	119	12.3	7.7	0	.2
Pork, carcass, medium, A.P. 7/	398	10.5	40.0	0	.2
Rabbit, fr., drawn, A.P. 7/	81	13.0	3.0	0	.2
C. EGGS					
Eggs, hen, dried	561	46.0	41.0	3	.5
Eggs, hen, fresh	158	12.8	11.5	.7	.2

3/ Equivalence based on protein content of dried cod.
4/ Representative of Pacific mackerel, sardines, salmon, bonita and eel.
5/ Representative of yellow-fin tuna, Pacific herring, millet, carp, codfish, and shark.
6/ Representative of flounder, sea trout and pargy.
7/ Based on American products.

IV. MILK	Calories	Protein	Fat	Carbo-hydrates	Milk, Evaporated Equivalence 8/
		%	%	%	
Milk, cow, condensed	327	8.1	8.4	54.8	1.1
Milk, cow, dried skim	359	35.6	1.0	52.0	5.0
Milk, cow, dried whole	496	25.8	26.7	38.0	3.7
Milk, cow, evaporated.	139	7.0	7.9	9.9	1.0
Milk, cow, fresh (3.9% fat). .	69	3.5	3.9	5.0	.5

8/ Equivalence based on protein content of evaporated milk.

V. SUGAR	Calories	Protein	Fat	Carbo-hydrates	Sugar Equivalents 9/
		%	%	%	
Sugar, white refined (cane or beet).	398	0	0	99.5	1
Sugar, brown.	382	0	0	95.5	1

9/ Equivalence based on caloric value.

VI. FATS and OILS	Calories	Protein	Fat	Carbo-hydrates	Fat Equivalence
		%	%	%	
Lard) Salad Oils)	900	0	100	0	1
Vegetable Oils) Oleomargarine	733	0.6	81	0.4	1

VII. VEGETABLES OTHER THAN ROOTS AND LEGUMES	Calories	Protein	Fat	Carbo-hydrates	Vegetable Equivalence 10/
		%	%	%	
Bamboo Shoots	33	2.5	0.3	5.1	2
Burdock	106	3.0	0.1	23.4	7
Cabbage, Chinese (Oriental) all varieties	16	1.4	0.1	2.4	1
Cucumber (Cucumis sativus Linn.)	10	0.6	0	1.8	1
Eggplant (Solanum melonga Linn.)	20	1.0	0	4.0	1
Greens, average	21	1.5	0.3	3.0	1
Lotus root (Nelumbium n. Gaerth)	12	0.4	0	2.6	1
Okra (Hibiscus asculentus Linn.)	29	1.8	0	5.5	2
Onion, dry (Allium capa Linn.)	37	1.0	0	8.2	2
Onion, green (Allium fistulosum Linn.)	33	1.8	0	6.5	2
Peppers (Capsicum annum Linn.) red or green	37	2.0	0.5	6.0	2
Radish (Daikon) (Raphanus setivus Linn.)	16	1.2	0	2.8	1
Water Chestnut (Scirpus tuberosus (Roxb.)	54	0.8	0	12.7	3

10/ Equivalence based on caloric values of Chinese cabbage and radish (daikon).

VIII. FRUITS	Calories	Protein	Fat	Carbo-hydrates	Fruit Equivalence 11/
		%	%	%	
Banana (Musa sapientum Linn.)	103	1.0	0.3	24.0	1.6
Breadfruit (Artocarpus communis Forst.)	109	1.5	0.3	25.0	1.7
Custard Apple (Annona reticulata Linn.)	81	2.0	1.0	16.0	1.3
Mandarin orange, orange, and tangerine	43	0.8	0	10.0	.7
Melons (Cucumis mole Linn.)	10	0.5	0	2.0	.2
Peaches (Prunus persica Stokes)	42	0.5	0	10.0	.7
Persimmons, Japanese (kaki)	66	0.6	0.3	15.2	1.0
Plums, Japanese type	63	0.7	0.1	14.9	1.0
Pear, prickly (Opuntia sapp.)	56	1.0	0	13.0	.9
Tamarind (Tamarindus indica Linn.)	277	3.5	1.0	63.5	4.4
Watermelon (Citrullus vulgaris Schrad)	26	1.0	0	6.0	.4

11/ Equivalence based on caloris value of Japanese plum.

APPENDIX G

PROXIMATE COMPOSITION OF AMERICAN FOODS a/

Per 100 Grams

I. STARCHY FOODS	Calories	Proteins	Fat	Carbohydrates	Rice Equivalence 1/
		%	%	%	
A. CEREALS AND CEREAL PRODUCTS					
Barley, pearl	357	8.2	1.0	78.8	1
Barley, whole	361	12.8	2.1	72.8	1
Biscuits, "C"	413	9.5	9.9	71.4	1
Corn, whole, yellow or white	365	9.1	3.7	73.9	1
Corn, degerminated, yellow	356	8.3	1.2	78.0	1
Cornmeal, degerminated, white	355	7.5	1.1	78.8	1
Cornstarch	352	0.5	0.2	87.0	1
Crackers	422	9.5	10.3	72.7	1
Cereals, prepared, assorted	359	7.9	0.7	80.3	1
Hominy	357	8.5	0.8	78.9	1
Macaroni and spaghetti	360	13.0	1.4	73.9	1
Noodles	385	14.3	5.0	70.6	1
Oatmeal	396	14.2	7.4	68.2	1
Rice, white, polished	351	7.6	0.3	79.4	1
Wheat, whole, grain	360	13.0	2.0	72.4	1
Wheat flour, straights (72% extraction)	355	10.8	0.9	75.9	1
B. ROOT VEGETABLES					
Potatoes, sweet, dehydrated	373	5.1	0.9	86.1	1
Potatoes, sweet, fresh	125	1.8	0.7	27.9	0.4
Potatoes, white, dehydrated	363	7.1	0.7	82.0	1
Potatoes, white, fresh	85	2.0	0.1	19.1	0.24

a/ Prepared in the Subsistence Division, Office of Quartermaster General. Based on values accepted by Committee on Food Composition, National Research Council.

1/ Equivalence based on caloric value of rice.

Proximate Composition of American Foods - cont'd.

II. SOYBEANS AND OTHER PROTEIN VEGETABLES	Calories	Proteins	Fat	Carbo-hydrates	Soybean Equivalence 2/
		%	%	%	
Beans, canned w/o pork . . .	117	5.7	2.0	19.0	.2
Beans, Kidney, dry	350	22.0	1.5	62.1	.6
Beans, Lima, dry	341	20.7	1.3	61.6	.6
Beans, Navy, dry	350	22.0	1.5	62.1	.6
Beans, pinto, dry.		Same as navy bean			
Beans, soy, dry.	351	34.9	18.1	12.0	1.0
Peanut butter, canned. . . .	619	26.1	47.8	21.0	.8
Peanuts, in shell, A.P. . .	432	19.4	31.8	17.0	.6
" E.P. (kernel)	600	26.9	44.2	23.6	.8
Peas, split, dry	354	24.5	1.0	61.7	.7
Soup, navy bean, dehydrated	332	17.6	1.2	62.7	.5
Soup, pea, dehydrated. . . .	336	20.4	1.2	60.8	.5
Soya flour, flakes or grits, low or practically fat free (1% or less fat)	246	44.7	1.1	14.2	1.3
Soya flour, flakes or grits, low or medium fat (about 7% fat).	283	42.5	6.5	13.6	1.2
Soya flour, flakes or grits, full fat (about 22% fat)	375	35.9	20.6	11.4	1.02

2/ Equivalence based on protein content of soybeans.

Proximate Composition of American Foods - cont'd

III. FISH, MEAT AND EGGS.	Calories	Protein	Fat	Carbohydrates	Fish, dried Equivalence 3/
		%	%	%	
A. FISH					
Fish, canned (representative of sardines, mackerel, tuna and salmon).	207	22.5	12.8	0.3	.3
Fish, dried, cod	352	81.8	2.8	0	1.0
Fish, hard smoked, herring type (34.6% water). . . .	290	36.9	15.8	0	.4
Fish, salted, cod	122	29.0	0.7	0	.4
Fish, smoke dried, mackerel type (59.4% water). . . .	212	23.8	13.0	0	.3
Salmon, all kinds, canned	169	20.6	9.1	0	.3
Sardines, canned, in oil. .	313	20.5	25.4	0.5	.3
Sardines, canned, in tomato sauce.	167	20.7	8.7	1.4	.3
B. MEATS					
Meat, canned, average (based on beef, corned, medium, canned)	232	24.4	15.0	0	.3
Bacon, canned	704	7.9	74.0	1.6	.1
Beef, fresh, roast, canned	217	25.0	13.0	0	.3
Chili con carne, canned w/o beans	198	10.2	14.1	6.4	.1
Chicken, boned, canned. . .	175	21.8	9.8	0	.3
Hash, corned beef, canned .	143	15.1	6.1	7.0	.2
Hash, M & V, canned	122	10.0	5.0	9.3	.1
Luncheon meat, canned . . .	270	15.2	22.5	1.7	.2
Meat and beans, canned. . .	117	5.7	2.0	19.0	.1
Sausage, pork, canned . . .	282	11.0	26.4	0	.1
Sausage, Vienna, canned . .	210	16.0	16.2	0	.2
Stew, M & V, canned	127	11.6	5.5	7.8	.1
C. EGGS					
Eggs, dried, whole	593	48.2	43.4	2.6	.6
Eggs, fresh, whole	158	12.8	11.5	0.7	.2

3/ Equivalence based on protein content of dried cod.

IV. MILK AND PRODUCTS, EXCEPT BUTTER	Calories	Protein	Fat	Carbohydrates	Milk, evaporated Equivalence 4/
		%	%	%	
Milk, condensed, sweetened	327	8.1	8.4	54.8	1.2
Milk, evaporated, unsweetened	139	7.0	7.9	9.9	1.0
Milk, skim, powdered. . . .	359	35.6	1.0	52.0	5.1
Milk, whole, powdered . . .	496	25.8	26.7	38.0	3.7
Milk, whole, fluid (3.9% fat)	69	3.5	3.9	4.9	.5
Cheese, American processed, canned.	382	21.9	31.8	2.0	3.1

4/ Equivalence based on protein content of evaporated milk.

Proximate Composition of American Foods - cont'd.

V. FATS AND OILS	Calories	Protein	Fat	Carbo-hydrates	Fat Equivalence
		%	%	%	
Butter, stablilized	562	5.2	56.7	7.7	1
Lard) Vegetable oil) Salad Oil)	900	0	100.0	0	1
Oleomargarine	733	0.6	81.0	0.4	1

VI. SUGAR, JAM, JELLY and DESSERTS	Calories	Protein	Fat	Carbo-hydrates	Sugar Equivalence 5/
		%	%	%	
Corn syrup	322	0	0	80.6	0.8
Dessert powder with gelatin or with starch	392	9.4	0	88.7	1
Jams and Marmalades	288	0.5	0.3	70.8	.7
Jellies	261	0.2	0	65.0	.7
Sugar, brown	382	0	0	95.5	1
Sugar, white, refined (cane or beet)	398	0	0	99.5	1

5/ Equivalence based on caloric value of refined white sugar.

VII. VEGETABLES OTHER THAN ROOTS AND LEGUMES	Calories	Protein	Fat	Carbo hydrates	Vegetable Equivalence 6/
A. VEGETABLES, LEAFY, GREEN & YELLOW		%	%	%	
Asparagus, canned	21	1.6	0.3	3.0	.5
Beans, string, canned	19	1.0	0	3.8	.5
Cabbage, dehydrated	346	13.7	1.8	68.8	8.9
Carrots, canned	30	0.5	0.4	6.1	.8
Carrots, dehydrated	361	4.0	1.4	83.1	9.0
Peas, green, canned	69	3.4	0.4	12.9	1.6
Spinach, canned	25	2.3	0.4	3.0	.6
Sauerkraut, canned	20	1.1	0.2	3.4	.5
B. VEGETABLES OTHER THAN L.G.Y.					
Beets, canned	39	1.0	0	8.7	1.0
Corn, canned	77	2.0	0.5	16.1	2.0
Onions, dehydrated	350	10.1	1.0	75.2	9.0
C. TOMATOES					
Tomatoes, canned	21	1.0	0.2	3.9	.5
Catsup, tomato	110	2.0	0.4	24.5	2.8
Juice, tomato, canned	23	1.0	0.2	4.3	.6

6/ Equivalence based on caloric value of canned beets.

Proximate Composition of American Foods - cont'd.

VIII. FRUITS	Calories	Protein	Fat	Carbo-hydrates	Fruit Equivalence 7/
		%	%	%	
A. CITRUS FRUITS					
Juice, grapefruit. . . .	41	0.5	0.2	9.4	.6
Grapefruit, segments, canned	81	0.6	0.2	119.1	1.1
B. FRUITS OTHER THAN CITRUS					
Apples, dehydrated . . .	390	1.4	1.0	93.9	5.3
Apricots, evaporated . .	292	5.2	0.4	66.9	4.0
Cherries, sour, canned .	86	0.6	0.1	20.8	1.2
Fruit cocktail, canned .	78	trace	trace	19.0	1.0
Peaches, canned.	75	0.4	0.1	18.2	1.0
Peaches, evaporated. . .	295	3.0	0.6	69.4	4.0
Pears, canned.	75	0.2	0.1	18.4	1.0
Pineapple, sliced, canned	87	0.4	0.1	21.1	1.2
Prunes, evaporated . . .	299	2.3	0.6	71.0	4.0
Raisins, dried	298	2.3	0.5	71.2	4.0

7/ Equivalence based on caloric value of canned peaches

IX. OTHER FOODS	Calories	Protein	Fat	Carbo-hydrates
		%	%	%
Bouillon cubes.	259	17.7	0	47.0
Cocoa	329	9.0	18.8	31.0
Pickles, sweet, relish. . .	11	0.5	0.2	1.9
Soups, canned, average. . .	36	2.1	1.0	4.6