The title assigned for this paper seems to imply, first, that the nation should have a grain reserve at all times and, second, that its maintenance is a matter of public policy. As a sometime farmer and intermittent Department official who served previously during the drought years of the 30's and World War II, I have no difficulty accepting this implication. While the argument for carry-over stocks as insurance against yield variations has not been very convincing for several years now, there is at the same time a singular lack of guarantees of this recent weather luck for an indefinite run.

Anyway, even if yield variations due to weather could be ignored, there are other sufficient reasons today for larger holdings of grain than at any time in the past. For one thing, there is always the chance of nuclear attack, widespread and sudden. Then there is the greater worldwide dependence on U.S. grain supplies which has developed among importing nations, especially since the advent of Public Law 480 programs. Reserve stocks in the U.S. protect these countries not only against crop variations in the United States but also against the effects of adverse weather and other developments in their own agriculture.

History of Food Reserves

The maintenance of reserves against all sorts of possible eventualities has been practiced by man in some degree since time immemorial, sometimes only by provident individuals, at times even by nations. In ancient China, the followers of Confucius worked out a plan under which a part of the crop in good years was bought up by the government, first to keep prices stable, then to be held for later years of poor crops. According to the historians, the plan was fairly successful and in effect off and on for more than 1400 years.

In ancient Egypt, a similar plan was followed by Joseph of Biblical fame. As set forth in the 47th Chapter of Genesis, the grain surplus was stored up during "seven fat (good weather) years" to be released during the "lean" years.

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What seems to have been the first systematic effort to maintain national grain reserves in the United States as a public policy occurred in the early 1930's. After the searing general drought of 1934, which had followed the rather poor corn years of 1930 and 1931, the national administration then in power, through Secretary of Agriculture Henry A. Wallace, began to advocate the adoption of an ever-normal granary policy. This was not a new idea for Wallace. He had started urging the principle for practice by farmers as early as 1912. He campaigned for it editorially in Iowa in 1920, along with a plea for less corn and more clover to reverse the collapse of grain prices after World War I.

What was new by 1934 was the proposal that the matter of a grain carry-over level be linked up with a federal crop acreage control program. A device for handling the carry-over reserve problem had been developed in 1933 -- the non-recourse government loan on farm-stored commodities.

The per-bushel rate for that first government loan on corn was 45 cents -- considerably above the market price at that time -- and it brought under seal a total of about 270 million bushels. This enabled farmers who grew corn for cash to benefit from the later rise in market value and to keep more corn in their hands than otherwise would have been the case for helping to preserve livestock herds through the great drought of 1934.

By the late fall of 1937, in a speech at Indianapolis before a conference of farmers, businessmen and labor leaders, Wallace was quantifying the ever-normal granary in these words:

A long stride ahead toward stability could be made with a carry-over in the future that would average twice as much as carry-over has averaged in the past. That would mean an average carry-over (of corn) of about 350 million bushels.

It should be noted here parenthetically that Wallace also warned against having loan rates too high in relation to year-to-year levels of production and prices, since if there were persistent losses to the government, the program would be discredited.

"Corn Belt farmers," he said, "should cherish it (the program) as something which is not primarily the government's but their very own. If they do not cherish it in this spirit, but organize in the spirit of temporarily looting the government, the final loss will be a greater loss to the farmers than if there had been no program at all."

This Indianapolis speech and other representations of that period were the prelude to the basic Agricultural Act of 1938, which provided
the machinery for carrying a national grain reserve jointly in private and government hands, facilitated by the non-recourse commodity loan device and protected against over-accumulation by voluntary producer programs for such land use adjustments as might be required.

This is not the place to recite further from history as to what then followed subsequently through the rest of the 30's and up through the 50's except to say that the grain supplies on hand at the beginning of World War II, as a result of the ever-normal granary principle, went far to bridge the gap until U.S. production itself could be brought to bear.

**Grain Carry-Over Since World War II**

It should also be added that the value of reserves for emergencies was again underscored in the immediate post-war years when relief and rehabilitation needs were substantial and U.S. stocks were relatively low. From a total of a little more than 23 million tons in 1940, the feed grain carry-in for 1947 was down to less than 8 million tons. Similarly the U.S. wheat carry-in dropped from a high of nearly 631 million bushels in 1942 to less than 84 million bushels in 1947.

Fortunately, there were supplies in some non-combatant countries, notably Argentina, which had backed up during the war for lack of shipping. Later, there was extensive discussion internationally, particularly by officials of the Food and Agriculture Organization, as to means by which a system of buffer stocks might be established and jointly supported. Agreement was never reached, however, as to a feasible means for financing and administering such a system.

At the beginning of the 60's there was a lot of confusion and disagreement over what American agriculture needed next, but there was one thing just about everybody agreed on. The nation's granary was far too full by almost any standard. In the absence of effective acreage controls, the carry-in by 1961 had reached almost 85 million tons of feed grains and more than 1.4 billion bushels of wheat. The government owned 85 percent of the wheat, about two-thirds of the corn and a substantial share of other feed grains. Besides, a considerable part of the "free" stocks of feed grains was under farm-stored government reseal.

Thus, the degree of underproduction that should be sought in the first emergency feed grain program in 1961 was scarcely a major consideration. It was rather generally assumed that such acreage diversion as farmers would be willing to make voluntarily and for which there would be funds would not reach the stocks reduction goal in one year anyway.
When producer response proved great enough in 1961 to effect a cut of nearly 13 million tons in feed grain stocks, despite record yields, the Department did begin the formulation of a minimum stocks level at which feed grain plantings might be relaxed enough to fully cover annual requirements.

It was about this time in late 1962 that Secretary Freeman indicated that this minimum for feed grains, based on preliminary staff work probably should be in the range of 45 to 50 million tons. In the months that followed, the problem was explored in greater detail, especially after the tension of the Cuban crisis in late October.

It is these more detailed recent studies that I shall now attempt to reflect in the balance of these remarks. I advisedly use the word "reflect" instead of "state" since Department staff people themselves have not concluded their recommendations on the reserve targets for each purpose and also since many of the figures have not been cleared by top government officials for public discussion.

As indicated at the outset, the question of a grain stocks level today necessarily must be related not only to yield variations but also to the possible contingencies of a nuclear attack and to variations in the needs of importing countries.

Defense reserve considerations today are greatly changed, even by World War II standards, from the days when emergency demands developed gradually and there might even be time to meet them through planting expansions in the following crop year.

**Carry-Over Needs Today**

Thus, any meaningful tabulation of carry-over needs today will have several headings: One for yield variations, of course; one for national disaster; one for strategic purposes to meet needs abroad and one for pipeline or working stocks.

As for the yield variation problem, this aspect has already extensively been treated here and will be further discussed in the next paper, by Mr. Upchurch. While his assignment is to relate yield variations to the task of farm program planning, stocks targets also must be related to such variations and it might be a helpful reminder to refer here to the swings in both wheat and feed grain average yields since 1901 through 1963.

In the five worst wheat years of that 63-year period yields were below average by about 4.3 bushels per acre. The corresponding short fall for other below-average years was 1.2 bushels per acre.
In the case of corn, the five poorest years for the same period were below average by 10.8 bushels per acre. The other below-average years were off by 2.1 bushels per acre. More or less comparable long-term variations were noted for the other feed grains -- grain sorghum, barley and oats. It is in the light of such data that the Department's current ideas on reserves are partly derived.

Computing a carry-over level for disaster or defense protection is very much a matter of judgment. As already indicated, I am not at liberty today to deal in specific levels, but I may say that Department staff people have been working on the assumption of having to supply for as long as 30 days somewhat more than the usual per-capita daily intake of wheat or wheat products, since availability of the usual foods may have been curtailed or terminated. In the case of feed grains, at least a 45-day supply has been under consideration.

As for a reserve against overseas contingencies, it is generally assumed that the principal areas or countries concerned would be in South-east Asia and parts of Africa. As a kind of benchmark, one starts with the notation that annual wheat imports to 11 countries of that part of the world during the 1952-61 period had a high-to-low range of about 245 million bushels. It is not considered necessary, of course, to assume that all of the population of the aforementioned areas would need extra wheat at any given time.

Our staff people have approached the problem by first estimating what it would take to supply each 100 million persons with 3/4 pound of wheat per day for 3 months. The answer is slightly over 100 million bushels. Where it would be nine months until a new (and presumably larger) U.S. crop could be harvested, the reserve supply per capita would need to be three times larger.

So far, consideration of a separate stockpile of feed grain for strategic needs has been somewhat limited. It is recognized that wheat stored to meet an overseas emergency could, if necessary, also be used to preserve foundation livestock herds. Wheat is a dual purpose grain that fits in well as a two-way reserve.

Furthermore, quantities designated for one emergency purpose could be diverted to another purpose if necessary. The chance of a national situation coinciding with a big drop in yield and increased overseas needs is considered rather remote, but concurrence of two out of the three possibilities must not be ruled out.

Not much needs to be said about pipeline stocks, but estimations of a desirable carry-over stocks minimum should allow for a normal volume of grains in trade channels and normal merchandising positions. This volume
has been variously estimated at from 75 to 100 million bushels of wheat and from 175 to 225 million bushels of corn.

To make a long story short, the opinion ventured by Secretary Freeman in late 1962 that a feed grain reserve of about 45 million tons would be about right still looks reasonable in the light of all the pencil work meantime. Such a reserve would be equal to about one-third of our annual needs for all purposes. If all of this reserve was in the form of corn, it would be about 1.6 billion bushels. Actually, our feed grain supply normally is about three-fourths corn.

Estimates of Proper Carry-Over

Estimates of a proper national minimum wheat carry-over for all purposes have usually ranged upward from 600 million bushels, the equivalent of about our annual domestic use for human consumption and a little less than one-half the normal total disappearance. The matter is reviewed periodically by Department staff people. Some studies now indicate that a reserve approaching 700 million bushels could be justified.

You recognize, of course, that national reserves of unprocessed grain are not the only elements in the national defense responsibility. A great deal of work has also been done and is continuing with respect to the establishment of a national processed or ready-to-eat food reserve.

It will be recalled that two years ago, the President submitted a proposal to build a national food reserve through the use of existing USDA funds. Committee spokesmen for the Congress countered by recommending that a proposal be developed for operation under a separate appropriation. This reflected a feeling, shared by most farmers, that the maintenance of a national food reserve, including wheat and feed grains, is a general public responsibility and should not be tagged as a regular USDA activity.

A bill authorizing a national food stockpile for domestic emergency purposes has now been drawn up for consideration by the Congress, but enactment in the current session is generally considered very unlikely.

Maintaining a national stockpile of the magnitude previously indicated is not a small financial matter. Along with the initial investment in the grains, there is the cost of annual storage and the handling charges incident to freshening the stocks by rotation sell-out and replacement. The cost of stocks rotation from government bins is a Department responsibility. In warehouses, it is up to the warehouseman under the customary storage agreement with the government to keep his total stocks so freshened that he could make delivery at any time of the amount, grade and quality of the grain shown...
on the warehouse receipts held by the government. At the moment, however, corn stocks in warehouses are from recent crops since most of the government-owned supplies in 1962-63 were bought by storing warehouses for current resale or loaded out to meet government sales commitments.

In this connection it might be mentioned that if stored initially in good condition both feed grains and wheat have been carried for at least 5 years without noticeable deterioration. In two tests with hogs at Purdue University and in one test with beef cattle at the Ohio Experiment Station, corn more than five years old from government bins compared favorably with new corn, even without Vitamin A supplementation.

Some part of the total national reserve, of course, will be carried by private individuals, such as grain dealers, feed manufacturers and farmers. However, when one considers the relatively low percentage of the crop that was carried over by the trade before federal farm programs came in, it is fairly clear that the government, one way or another, probably will have as much as two-thirds of the burden.

From the annual average corn (for grain) production of about 2,231 million bushels in the five-year (1925-29) period with a high and low difference of about 247 million bushels, the annual October 1 carry-out averaged a little less than 175 million bushels and non-farm holders accounted for less than 12 million bushels of this total. In proportion to the average annual wheat crop for the 1929-33 period, the average July 1 wheat carry-out was more than three times larger, and the private trade also held a much larger percentage of this total. However, even on a per capita basis it was only about 60 percent as large as the reserve not contemplated.

This past tendency of the trade to push on to the market for current use any grain above a certain stocks level is understandable. It costs money to carry grain and then there always is the chance of developments to cause a fall of the inventory value.

It is this tendency on the part of the private firms and individuals to use or otherwise dispose of even a large crop rather completely that leads to undesirable fluctuations in the production and price of both grains and livestock. Even if there were no defense considerations, a good case could be made for a fairly sizeable national grain reserve to ensure the American people a stable supply of farm products at reasonable prices and at all times.

Incidentally, as of April 30, the latest date for which I have figures, government feed grain stocks alone amounted approximately to 40 million tons, of which about 70 percent was stored in warehouses. Over 500 million bushels also were on farms under a continuing reseal price support loan agreement. As of April 30 the government also owned 813 million bushels of wheat, mostly all in warehouse storage. The amount of farm-stored wheat under continuing reseal was less than 60 million bushels.
Proper Location of Reserves

There are questions of location as well as quantity levels in connection with the national reserve problem. In general, and aside from the unpredictable logistics related to a nuclear attack, it is Department policy to keep government-owned grain or farmer-held grain under loan reseal as much as possible in the areas where produced. This minimizes the investment in transport of grain to areas where it may eventually prove not to be needed. A certain level of supplies is maintained at terminal points by in-shipments from the country to facilitate export sales and to meet large domestic commitments.

From a defense standpoint, however, location is determined somewhat differently. One school of thought holds that even under normal conditions it would be far more desirable in an emergency and good insurance to have a reserve of emergency food supplies, including wheat and feed grain stocks, available in non-vulnerable positions near the point of consumption than to have these stocks stored near the producing areas where they would have to be transported long distances to feed the consuming population.

This sounds reasonable in theory, but in many food-and-feed-deficit areas, the amount of space suitable for long storage is quite limited and in the case of food grains, processing capacity is also inadequate. Besides, it is difficult to decide which locations are really "non-vulnerable."

All I can tell you at the moment is that some progress has been made in this matter of food reserve location, but ideas are still somewhat fluid.

What we do take as no longer debatable is the fact that the federal defense responsibility for programs affecting the production, processing, storage and distribution of food, is that of the Department as delegated by the President. This is one responsibility which our national proclivity for abundant production does make easy. There is no nation on earth in which it is so easy really to arrange for an adequate carry-over of food in every form.