commodities, is dependent upon the dollar reserves of overseas nations and the extent to which the peoples overseas increase their standards of living and create greater demands for food.

Many economists seem to be agreed that the dollar shortage is the limiting factor in the expansion or contraction of overseas markets for American products.

In the last analysis the only way for potential buyers overseas to obtain the means of purchasing our products is to acquire capital, dollars. They can only acquire dollars by selling to the U. S. Immediately following the war, overseas buyers were receiving a steady supply of dollars from the U. S. not by sale of goods and services but rather by gifts and loans from the American Government. Recently there has been a decline in the value of these dollar gifts to foreign nations. Increasingly they are being expected to get their own dollars through the channels of international trade.

There has been a steady increase in the buildup of dollar reserves obtained by trade in foreign nations and in many cases these nations are in a position to buy American farm products. However, this increase in dollar reserves has in many cases coincided with increased agricultural output. From the postwar "seller's market" for food, international trade has moved to a situation where a "buyers" market now exists. Iu most cases the prices on U. S. commodities are above the prices on the same commodities in other countries. In this situation many of our potential foreign customers have found cheaper sources for food imports, preferring to spend their dollar reserves for commodities which can only be obtained in the U. S.—for example, machinery. In some nations the import of American agricultural commodities is restricted by government control.

Faced with this problem the U. S. Government has established a bipartisan commission to study the general problem of foreign trade and export markets for American products. The incongruity of agricultural surpluses can only be solved by increasing overseas markets.

Cloud of dust which attends handling of mixed feeds is eliminated by proper incorporation of 1 to 3% animal fat, says E. E. Rice of Swift. Sample bottles show how color of ordinary poultry feed (left) is heightened by presence of fat

Use of Fats in Animal Feeds Promises to Relieve Fat Surpluses

Studies indicate animal fats in feeds can increase feed efficiency by 10%

CHICAGO.—The meat packing and rendering industries appear well along the road toward solving one of their own biggest headaches. The problem: mounting surpluses of inedible fats, caused chiefly by heavy inroads of synthetic detergents in soap markets, traditionally major outlets for animal tallows. The possible solution: "recycling" the inedible fats by mixing them into animal feeds as partial replacement for feed grains or other nutrients.

Use of animal fats in animal feeds has risen rapidly during the past few years, and interest in the development led to the scheduling of an entire half-day session on the subject at the 27th fall meeting of the American Oil Chemists' Society held here Nov. 2 to 4. Stage for the discussion, devoted primarily to research and development aspects of the problem, was set by H. R. Kraybill of the American Meat Institute Foundation, who presided at the Tuesday afternoon session. About 2.5 million pounds of inedible tallows and greases will be produced in this country in 1953, Kraybill said; the efficient utilization of these fats is of importance to the entire national economy, since profit or loss on by-products in the mammoth meat packing industry strongly influences prices consumers pay for meat products, prices and production rates for livestock producers, and profits—or losses—for the meat processing industry itself.

In 1952, said Kraybill, there was a surplus of about 777 million pounds of animal fats in this country. A recent study (AG AND FOOD, July 8, page 552) of production and utilization trends indicates that by 1957 there may be an annual surplus of 1.1 billion pounds, with the prospect that that level of surplus might be maintained for several years. If research can uncover new uses for these surplus fats, observed Kraybill, it would certainly provide a "much more effective and economical method of alleviating the price-depressing effect of surplus agricultural commodities than the method of purchase and storage by the Government." Actually, research results reported at the Chicago meeting indicate that by using fats in various animal feeds probably the entire surplus could be efficiently utilized by the meat-producing industry itself.

Current price trends of low-grade animal fats make them competitive with corn for poultry feed, for instance, when considered on a calorie-cost basis, according to M. L. Sunde of the University of Wisconsin. Previous work had indicated that up to 8% can be fed to hens without decreasing egg production, or to broilers without adversely affecting growth rates, Sunde said. More recent experiments at Wisconsin have shown, he added, that feed efficiency actually can be improved about 10% in broiler mashes through the addition of animal fats, although no consistent improvement in growth rate was observed. With turkeys, addition of low-grade animal fats in starter mashes improves both efficiency of feed utilization and rate of growth. With an estimated 29 million tons of feed to be used by the poultry industry during the current feed year, Sunde observed, it is evident that incorporation of even a 2 to 5% portion of fats in the feed would account for a healthy share of the fat surplus.

In studies with poultry and dog rations initiated some four years ago, reported B. S. Schweigert of American Meat Institute Foundation, it was found that addition of 4% of stabilized animal fat to dog diets gave results comparable to or better than those with basal rations in terms of growth rate, food and caloric utilization, maintenance, reproduction, and lactation. Studies with chicks raised to broiler age (10 weeks) similarly showed that up to 8% added fat is efficiently utilized. While there is evidence that the presence of fat in the diet does affect the composition of deposited fats in the animal carcass, said Schweigert, there is no detectable change in flavor of the meat produced with fat-added diets.

Feeds for beef cattle offer one of the most promising and potentially the largest outlet for surplus fats, according to J. Matsushima of the University of Nebraska. Preliminary feeding tests, he said, have shown that beef tallow administered in the form of pellets

containing ground corn cobs, soybean meal, molasses, urea, bone meal, and the tallow provides a rate of weight gain roughly comparable to that of steers on a standard ration of ground shelled corn, soybean meal, and brome hay. The economy of gain, on the basis of current feed and fat prices, was highly in favor of the steers fed beef tallow pellets. Feed costs per hundred pounds of weight gain, Matsushima reported, were $26.49 for the steers fed beef tallow pellets, $27.67 for those fed the standard ration, and $31.96 for a group fed the same ingredients as those receiving beef tallow pellets, but with corn oil replacing tallow as the added fat component. Preliminary estimates that a suitable addition to cattle rations would be 0.5 to 0.75 pound of fat per day for each 1000 pounds of live weight indicate that virtually the entire annual surplus might conceivably be worked off in cattle feeds. If 10 million cattle were each fed 1/4 pound per day for 100 days, for example, 250 million pounds of fat would be consumed. The total cattle population in the United States is currently estimated at 94 million head.

The nutritional value of fats in feeds now seems to be well established, but as pointed out by E. E. Rice of Swift & Co., physical characteristics, palatability, stability, prejudices, and price must also be considered in deciding whether to attempt large-scale use of fats as feed additives. Price has limited the use of fats in this way in the past, he said, but at current prices calculations indicate that low-grade fats can be added to rations for virtually all meat animals with considerable economic advantage. In many cases, he said, the improved efficiency of feed utilization attending the use of fats makes these materials worth 5 to 10 times as much in the feed as the corn they would replace.

In addition to nutritional economies, the use of 2 to 3% of fats often improves feed palatability and virtually eliminates troublesome dusting which with ordinary mixed feeds is a major problem for the manufacturer and at least an annoying one for the livestock feeder. If all mixed feeds now produced were enriched with 1% of added fat, Rice estimated, 700 million pounds of fats per year would be required, or an amount about equal to the total 1952 fat surplus. Addition of 3% of fat would require over two billion pounds per year, or nearly the entire current annual production of fats mentioned by Dr. Kraybill.

To ensure against the development of rancidity in fat-fortified mixed feeds, it would probably be necessary in all cases to use antioxidants to stabilize the fats. Pilot scale studies and actual commercial scale tests on stabilization have indicated, according to L. R. Dugan, Jr., of the American Meat Institute Foundation, that stabilization can be accomplished economically by incorporation of antioxidants during or, in some cases, even before the rendering process, rather than after. While this investigation is not yet completed, said Dugan, and results are not entirely consistent, it does seem likely that practical, inexpensive methods of large-scale stabilization of low-grade fats can be developed. Feed users thus can plan to take increasing advantage of the availability of this plentiful energy source.

Color Plays an Important Role in Food Preference

Physical and chemical methods are necessary for objective determination of color

CHICAGO.—Color is an important factor in determining food preference; people learn to expect certain colors in their food and any variation from the expected color will lower the preference. Sometimes a variation in color will become identified in the consumer's mind with lowered quality, said Howard G. Schultz, Quartermaster Food and Container Institute, at the symposium on color in foods here Nov. 3 and 4. The symposium was sponsored by the National Research Council and the QM Food and Container Institute and was attended by 128 chemists, physicists, and food technologists. This is thought to be the first meeting bringing together scientists from several fields interested in the problem of food color.

The quality of the light source, the physical and chemical make-up of the object, and the sensitivity characteristics of the eye determine the color as perceived by the eye. In order to consider color it is first necessary to standardize the light source and eye characteristics, said B. A. Brice, Eastern Regional Research Laboratory. Hue, saturation, and lightness must be taken into account.

Reflectance and transmittance data may be used to describe colors in standard terms by using the system established by the International Commission of Illumination (CIE) in 1931. Using this information and tabulated CIE data, the dominant wave length, excitation purity, and luminous reflectance and transmittance, corresponding to hue, saturation, and lightness can be calculated. These methods are somewhat unwieldy and are often replaced by simpler comparative tests.

Storage Changes. Pureed fruits and vegetables and preserved fruit products have been observed to undergo two types of discoloration on storage, according to G. E. Livingston and C. R. Fellers, University of Massachusetts. In the area of the food in contact with headspace gas there

G. E. Livingston (left), University of Massachusetts; E. E. Meschter, American Preserve Co.; C. R. Fellers, University of Massachusetts; and K. T. Farrell, Quartermaster Food and Container Institute, were among the speakers discussing colors in foods