Nitrogen Discounts

Scheduled prices intact at present, but tendency to offer discounts for early shipment growing. Latest to join discount list—ammonium nitrate

NITROGEN PRICES should remain firm over the second half of 1955. That's the contention of manufacturers. They cite two basic facts to support their view:

Contract prices have been established for the fertilizer season which began July 1, and price reductions would not stimulate buying owing to seasonal characteristics of the industry.

Inflationary forces are already at work as the result of wage increases in the steel and automobile plants, which may be reflected in time by all commodities.

But while scheduled prices are intact at this time for anhydrous ammonia, ammonium nitrate, sodium nitrate, and ammonium sulfate, the tendency nevertheless is increasing in this industry to offer discounts for early shipment. The latest large-consumption nitrogen product to adopt the discount idea is ammonium nitrate.

Anhydrous ammonia is the key to the nitrogen market situation. It is the basic product in the manufacture of not only ammonium nitrate but also of synthetic sodium nitrate, nitrogen solutions, synthetic ammonium sulfate, and urea. Changes either way in the anhydrous price would affect in some degree these other materials. In prewar times when anhydrous ammonia was a minor factor in agricultural nitrogen, leadership in establishing prices was taken by Chilean nitrate of soda and domestic coke-oven ammonium sulfate.

Since then ammonia production has been expanded considerably, and there is no need here to omit the fact that lower prices have been more or less expected. Many new interests have entered the ammonia manufacture field, and the pressure of this enlarged capacity undoubtedly is being felt in some quarters of the ammonia industry at a time when agricultural demand is not keeping step with greater production.

The tank car quotation for anhydrous ammonia, however, is being maintained at $85.00 per ton, f.o.b. plant, and following the more or less general practice of the chemical industry, the freight rate is being equalized with competing shipping points.

In addition to the seasonal factor and the possible role of inflation, ammonia producers are citing upturns in costs, labor and materials principally, which have taken place within their own industry.

To meet the competition offered by an ammonia producer in the petroleum industry, chemical manufacturers are offering ammonium nitrate at discounts which scale down from $4 per ton for September shipment to $1 for December. American Cyanamid is quoting the product at $70 per ton at Port Robinson, Ont., and equalizing freights up to $8 per ton in meeting competition on this product.

Ammonium nitrate at one time sold as high as $170 per ton. This level was reached in 1930–31. Within two or three years the price had been brought down to $80, or less than one-half of its record high. Further declines found ammonium nitrate at $43 when World War II ended. Its supply meanwhile had been expanded through new facilities for anhydrous and nitric acid.

Ammonium sulfate may be in better supply for the 1955–56 season as the result of a higher rate of steel operations. Current prices range from $42 to $45 per ton at coke oven centers, excepting at St. Louis where the price is $47. The sulfate quotations are subject to discounts for early shipment. These amount to $3.00 per ton for shipments that were made in June and July; $2.00 per ton for August and September; and $1.00 per ton for October and November.

Coke-oven ammonium sulfate has to sell competitively against synthetic and imported ammonium sulfate. To meet this competition coke-oven sellers have established a price of $44 per ton in bulk, f.o.b. cars, at Atlantic and Gulf ports, without seasonal discounts. An exception to this is the Port of Boston where the price is $43 per ton.

Synthetic ammonium sulfate at this writing is being named at $42 per ton by five chemical and petroleum interests. They are, Allied Chemical and Dye Corp., f.o.b. cars, Hopewell, Va.; Rohm and Haas, Bristol, Pa.; American Cyanamid Co., Avondale, La.; Lion Oil Co., El Dorado, Ark.; and Phillips Chemical Co., Houston, Tex. (The port price of Phillips Chemical is $44 per ton).

The Matthieson & Hegeler Zinc Co., has established its price for synthetic ammonium sulfate at $46 per ton, f.o.b. cars, La Salle, Ill. As in the instance of the coke-oven product, synthetic sulfate is subject to seasonal discounts of the same extent.

Coke-Oven Ammonium Sulfate Prices

(July 1955–June 1956 shipment, f.o.b. ovens in bulk)

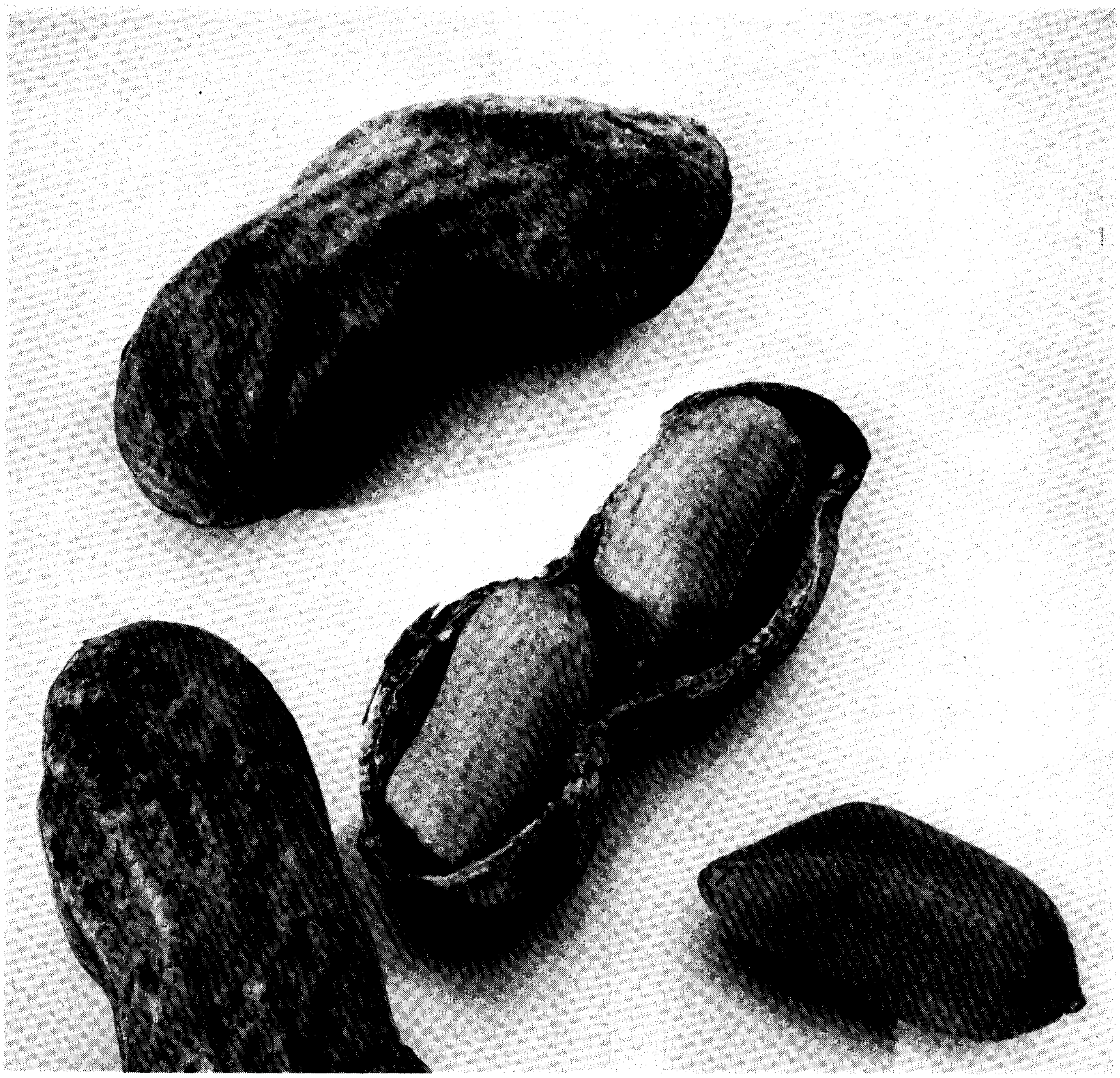
	Per Ton
Pittsburgh district	$42.00
Buffalo district	42.00
Cleveland	42.00
Youngstown	42.00
Erie	42.00
Johnstown	42.00
Bethlehem	42.00
Steelton	42.00
Philadelphia	42.00
Conshohocken	42.00
Morrisville	42.00
Sparrows Point	42.00
Birmingham district	42.00
Holt, Ala.	42.00
Hamilton, Ohio	43.00
Kearney, N. J.	43.00
Alabama City, Ala.	43.00
Port of Boston	43.00
Geneva-Ironton, Utah	44.00
Detroit	44.00
Chicago district (dried)	45.00
Chicago district (undried)	42.00
Lorain	45.00
Toledo	45.00
St. Paul	45.00
Duluth	45.00
St. Louis	47.00

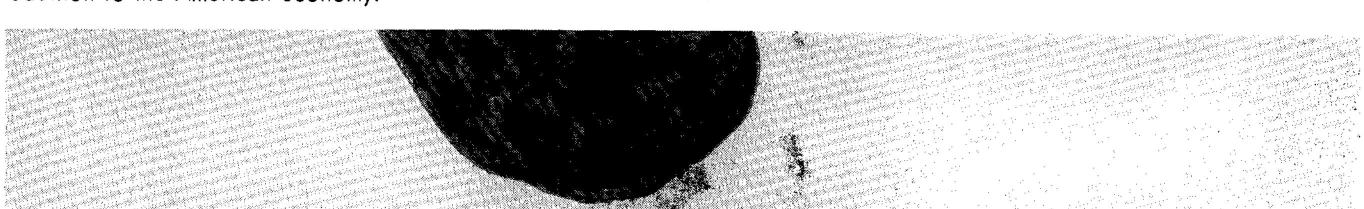
(Source: Nitrogen Products, Inc.)

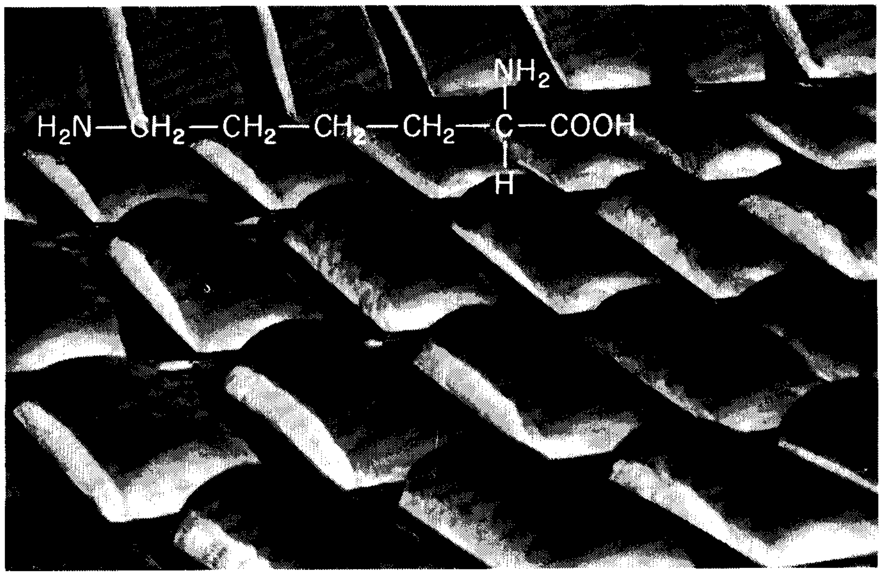
Synthetic Amino Acids

Enrichment with them can upgrade many proteins, but NRC sees no need for extensive U. S. program

UNDOUBTEDLY, the bulk of the amino acids needed to feed the world population must continue to come from plant and animal proteins. However, there are cases where the nutritional value of a protein is limited by a deficiency of one of the essential amino acids, and then enrichment with a synthetic amino acid will increase the protein's value by several times the cost of the added material. Proteins are not utilized in the body as such, but are broken down into their component amino acids, which are then recombined to form the body's own protein. For protein synthesis it is necessary that all the required amino acids be present simultaneously; the lack of any one essential amino acid will bring about the waste of all the others. In a human or animal diet containing proteins from several sources, amino acid deficiencies in individual proteins are often cancelled out by excesses in others, but there are situations where the variety of proteins in the diet is not great and then it may be advantageous to use synthetic amino acids.







Lysine enrichment would add about two cents to the cost of a loaf of bread

Today methionine and lysine are the only synthetic amino acids available in sufficient quantities and at a low enough price to be considered for enriching animal feed or human food. Methionine has been on the market for some time and is being used extensively in poultry feeds. It is used to some extent in swine feeding and recently a dog food manufacturer has started to add it to his product—the 25-million dogs in the U. S. offer a not insignificant potential market. Dow, Du Pont, and U. S. Industrial Chemicals are the chief methionine producers. Last December Du Pont started producing L-lysine on a pilot-plant scale. Dow has produced a mixture of D- and L- forms previously.

At the current price of $12 per pound, lysine has certain commercial limitations. Considering the much greater price of some of the vitamins added to both human and animal food products, this may not seem high, but the larger quantities of amino acids required to supplement diets results in higher final enrichment costs. Nor are the drastic price reductions which followed the introduction of the first vitamins to be expected. It is true that methionine dropped from $400 to $2.65 per pound (feed grade) in fifteen years, but the initial product was not intended for commercial feed enrichment. Synthetic lysine was not put on the market until it could be produced cheaply enough to warrant serious consideration as a human nutrition supplement. Lysine is now being offered by Du Pont for $12 per pound. Some reduction may be expected in the future, but it would be surprising if the price is reduced to less than $3.00 any time soon.

Methionine has been used for some time to enrich poultry feed and now dog food

The advisability of large-scale supplementation of the U. S. diet with synthetic amino acids has been examined recently by the Food and Nutrition Board of the National Research Council, and their recommendation is essentially negative as far as peacetime food requirements are concerned. This does not mean that there is not a place for synthetic amino acids in our economy. Methionine has proved valuable in animal feeding and has consequently enjoyed a commercial success. Initial markets for lysine and any other amino acids which may make their appearance on the market later will be in specialty products. In a national emergency, restricting protein supply, of course, amino acids might be much more valuable. Today in areas of the world less developed economically amino acids might also be more useful. Diets consisting predominantly of wheat, corn or rice need lysine. Unfortunately, in these areas the economic conditions are such that it is even more difficult to support the high cost of purchase or manufacture of these synthetic compounds.

Lysine Used to Enrich Bread

Du Pont is moving cautiously in the commercial development of its lysine. Cereal proteins are generally low in lysine, so bread is a natural starting point. Enrichment with lysine at $12, adds about two cents to the cost of a loaf of bread. With such a low cost item as bread this could be prohibitive for ordinary white bread. There would also have to be changes in the regulations regarding ingredients permitted in white bread. However, the A & P food chain is adding lysine to a specialty loaf of protein bread it sells. It appears to be receiving good acceptance and at least one other bakery has also started the practice. It is also being used in a cookie produced by Burry Biscuit Corp. of Elizabeth, N. J. It is the company's intention to improve nutritive properties of a product consumed largely by children.

Infant and geriatric foods offer another possible market. The value of supplementing infant diets with lysine has been proved conclusively and a supplement for infants' milk formulas is available. Geriatric foods are not sold in sizeable quantity today, but infant food manufacturers are investigating them with an eye to an increasingly important market as the proportion of older people in our population increases. Lysine is rather expensive for animal feed use, but it may find a place in the feed industry as its price decreases. Cottonseed meal, which promises to grow in importance as more processing plants which remove the harmful gossypol it contains are built, is deficient in lysine and might be profitably supplemented.

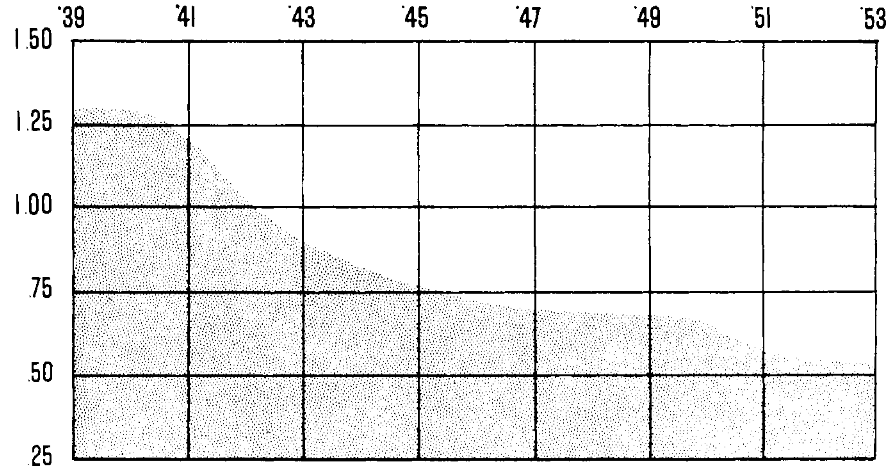
The NRC committee's lack of enthusiasm for extensive amino acid enrichment of the country's food supply is based on the variety of our dietary proteins. Bread proteins are eaten along with meat, milk, and other protein containing foods. There may be some advantage, however, of bringing the value of each individual food up to its maximum for the sake of those who do not eat properly balanced diets.

Lysine is just beginning to feel its way around the market place and it will be at least two years, and probably longer, before it will be in full-scale production and can join methionine as a really commercial product. Tryptophane has some potential in swine feeding, but is still too expensive. Much farther away from the market is threonine. The integration of synthetic amino acids into our over-all food production scheme will undoubtedly be slow, but it nevertheless seems to be proceeding steadily.

Tin-Less Cans

Concerted efforts being made to eliminate tin in cans for food packing, but no one satisfactory substitute is seen for awhile

AVERAGE POUNDS OF TIN USED PER BASE BOX



BEING CUT OFF from world tin sources could be a real danger, and research on substitutes for tin in can manufacturing has been accelerated. Prompted by tin shortages in World War II, producers of food cans embarked on a program of study to determine what substitutes can be utilized satisfactorily. The Korean War renewed interest in the program, and studies are currently being made on a number of materials, despite stockpiling of tin and tinplate by Government and industry. The Government's stockpiling program for tin has reached its goal, and the several hundred thousand tons of tin on hand provides an adequate supply of tin for seven to 10 years at current consumption rates. Every peacetime year adds another half year's supply from the surplus mine production.

Perhaps no one metal coating on steel will serve as a universal alternate for tin, but substitutes may come from a number of metals, each tailored to fit a specific need. One of the most thoroughly studied substitutes is aluminum, which is plentiful and readily adaptable to a variety of uses.

Aluminum cans are being made and used in Europe to a much greater extent than in this country. Lack of tin smelting facilities results in a relatively high price for tinplate there, and the cost of aluminum sheet compares favorably with the cost of tinplate. Norway is producing food cans from continuously anodized and lacquered aluminum alloy strip more cheaply than from tin-coated steel. However, recent construction of European tin refining units and resulting lower cost of tinplate will probably reduce use of aluminum in food canning.

Economics are not the only handicap to commercial application of aluminum in the United States: Only foods of a relatively neutral acidity could be successfully packaged in aluminum; and handling of canned items would have to be modified drastically to prevent excessive container damage due to the metal's softness. Also being investigated is aluminum-coated steel obtained by cladding, electroplating, and vapor deposition. In these instances, aluminum supplies the necessary protection, and strength is obtained from the steel.

Other domestic metals that may be promising replacements for tin include zinc, nickel, titanium, and chemically treated steel. Even though comparatively plentiful, titanium also poses the problems of high cost and technological changes required to utilize it. Nickel-plated steel can be successfully worked at commercial can making speeds on conventional equipment. Chemically treated steel (usually Bonderized) holds promise of being one of the first alternates for tinplate. Used during the war, chemically treated steel plate is rust resistant. Emphasis is being placed on the development of economical methods for continuous chemical treating of the steel coils at steel mills.

Steel without tin is currently being used principally for packaging dry products, as organic coatings commonly used on tinplate do not adhere well when tinless steel cans undergo steam pressure processes. Packing these cans with vegetables, meats, and other low-acid foods requires a process-resistant inside enamel in addition to outside coatings, which resist both the process and abrasions in handling. The most generally used coatings in the can industry are oleoresins, although studies are being made on the use of epoxy, phenolic, and urea-formaldehyde resins. Silicones and fluorocarbons are under consideration, but no application of these has been developed as yet.

No method of applying coatings that guarantees fool-proof protection has been devised. Microscopic holes (perforations) in the coatings occur at times, hastening corrosion of the container.

Paperboard containers are undergoing studies directed toward their use for other than dairy products. Salt, frozen foods, and ready-to-bake-biscuits are recent applications of paper in food packaging. Here again, coatings and their application pose problems. The end use of a carton determines the type of coating to be used. Paraffin, plastic cements, asphalts, adhesives, and laminants are materials most adaptable to coating of paperboard.

A facet of the tin replacement program that has a bearing on the kinds of substitutes that will eventually be used is the sealing of the can's side seam. Replacing conventional tin-lead solder with high-speed welding has been accomplished, and can be an important step in the development of tinless cans. Welding offers many advantages not available in conventional soldering, being generally applicable to metals whereas soldering is limited to a few. Non-solderable chemically treated steels for use in the manufacture of food cans could be made practical through welding.

Cemented side seams have already found application in cans for packaging dry foods. Frozen fruit concentrates are currently being put up in cans with cemented seams, which may ultimately be preferable to welded or soldered seams.