

**THE  
MACARONI  
JOURNAL**

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**August, 1982**

# Macaroni Journal

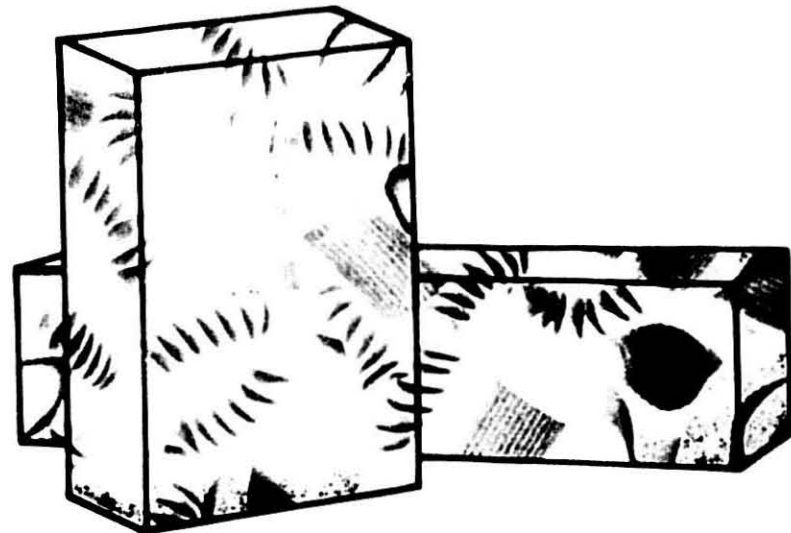
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AUGUST, 1982



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The

Macaroni

Hours

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Directors

Joseph P. Viviano  
Elected NPA President

Attention Calorie Counters!

Slim Line Macaroni and Cheese



## Attention, Calorie Counters!

(Continued from page 3)

- 3 tablespoons non-fat dry milk solids
- 1 cup water
- 1 cup creamed cottage cheese
- 1 teaspoon onion salt
- 1/4 teaspoon pepper
- 1 can (12 ounces) luncheon meat, diced
- 2 tablespoons chopped parsley
- 1/2 cup grated Cheddar cheese

Add 1 tablespoon salt to 3 quarts rapidly boiling water. Gradually add macaroni so that water continues to boil. Cook uncovered, stirring occasionally, until tender. Drain in colander.

Melt butter; add flour and milk solids and blend. Gradually add 1 cup water and cook over low heat, stirring constantly, until thickened. Add macaroni, cottage cheese, onion salt, pepper, luncheon meat and parsley; mix well. Line a 10 by 2-inch skillet with aluminum foil. Turn macaroni mixture into skillet and top with Cheddar cheese. Cover and bake in 350° (moderate) oven 45 minutes.

## Sodium Labeling Proposal

Food and Drug Administration has unveiled proposals to revamp its regulations governing declaration of sodium content of foods and use of label claims on the basis of sodium content. Although voluntary for many foods, sodium content labeling will be mandatory for products containing enriched flour utilizing nutrition labeling.

Announced June 15 and published in the *Federal Register* of Friday, June 18, the proposal includes the following major initiatives.

- Specify that sodium content of foods be included in nutrition labeling information whenever nutrition labeling is used.
- Establish definitions, and maximum levels of sodium content, for use of terms such as sodium-free, low sodium, moderately low sodium and reduced sodium.
- Provide for voluntary inclusion of potassium content on nutrition labels.
- Issue statement of policy on appropriate use of comparative sodium content label statements.
- Eliminate the requirement that sodium be listed in milligrams per 100

grams of food and require only listing of sodium in milligrams per serving.

The following are the proposed definitions of descriptive labeling terms on sodium content:

**Sodium-free:** To apply only to those foods which contain 5 mg or less of sodium per serving. "Sodium-free foods, as defined by this proposal, would provide a trivial amount of sodium to the total diet for all individuals, except for those on extremely stringent sodium restrictions."

**Low sodium:** To apply only to those foods which contain 35 mg or less of sodium per serving.

**Moderately low sodium:** To apply only to those foods which contain 140 mg or less of sodium per serving.

**Reduced sodium:** May be used only on the labels of foods that have achieved, through special processing, at least a 75% reduction in sodium content over foods for which the reduced sodium foods serve as direct replacements. If a food is labeled reduced sodium, the label must bear information comparing the product's sodium content, per serving with that of the food it replaces.

## Starch Blockers

With an estimated one-quarter of Americans classified as obese — meaning they carry 20% more weight than is considered normal — and with many other people slightly to moderately overweight, you might at one time or another consider going on a diet. And because a barrage of advertising and promotion is under way for numerous brands of a new kind of dieting aid, you will probably be wondering what a "starch blocker" is. More, you will wonder whether it works.

Known technically as an amylase inhibitor, a starch blocker is a protein derived from kidney beans that purportedly acts within the digestive system to prevent starch from being absorbed and turned into calories. The protein products are sold under such names as Starch Blocker, Blockout, Sta-Trim, Calorex, Carbo-Lite, Amal-X, and AmvLite. The marketers contend that a starch-blocking tablet taken just before a meal lets a dieter eat bread, pancakes, spaghetti, bananas,

and other starch-laden foods — with much less weight gain than might usually take place.

The products' effectiveness, however, is a matter of controversy: both within the medical profession and among advocates of other ways to reduce weight.

Because the protein starch-blocking tablets are sold as a food or dietary supplement, the Food & Drug Administration initially did not demand proof of their efficacy and safety, as is required with pharmaceutical products. But an FDA spokesperson notes that the department has begun looking into starch blockers "because, if they inhibit the action of digestive enzymes as their makers claim, they would be considered drugs."

## National Research Council Urges Grain Consumption

Daily consumption of whole-grain cereal products is among dietary recommendations by an expert committee of the National Research Council, which disclosed the findings of a two-year study exploring the relationship of diet to cancer.

The N.R.C. committee on diet and cancer set out the following dietary recommendations:

• "Eat less foods high in saturated and unsaturated fats. Overall, the committee recommended that fat should be reduced to about 30% of daily calories. (The major sources of fat in the American diet are fatty cuts of meat, whole-milk dairy products, and cooking oils and fats.)"

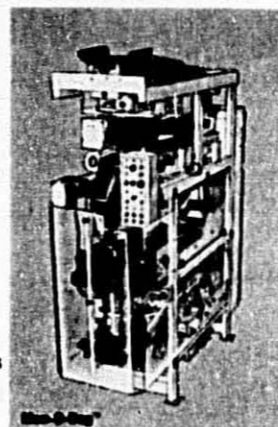
• "Eat fruits, vegetables and whole-grain cereal products daily, especially those high in vitamin C, carotenoids, which converts in the body to vitamin A, and other as yet unidentified compounds that may protect against certain cancers. (These foods include oranges, grapefruit, dark-green leafy vegetables, carrots, winter squash, tomatoes, and vegetables in the cabbage family such as cabbage, broccoli, cauliflower, and Brussels sprouts.) The committee recommended against high-dose supplements of individual nutrients."

• "Eat very little salt-cured, salt-pickled, and smoked foods. (Examples of such foods commonly eaten in the U.S. are sausages, smoked fish and ham, bacon, bologna and hot dogs.)"

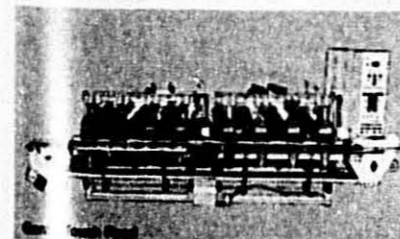
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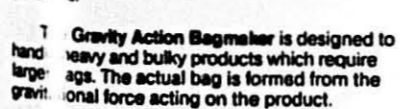
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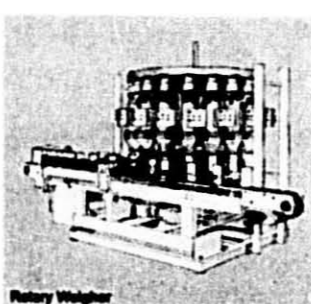
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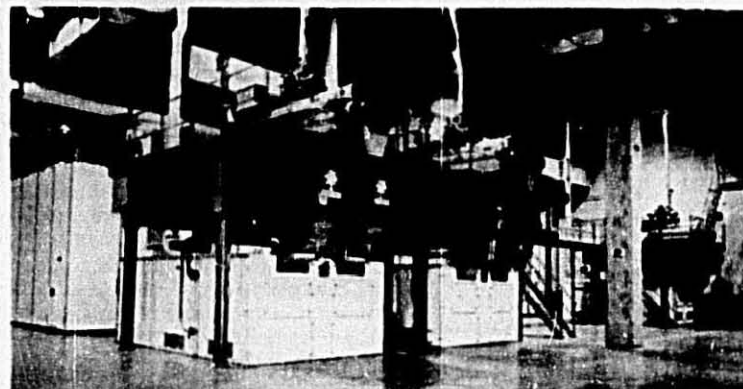
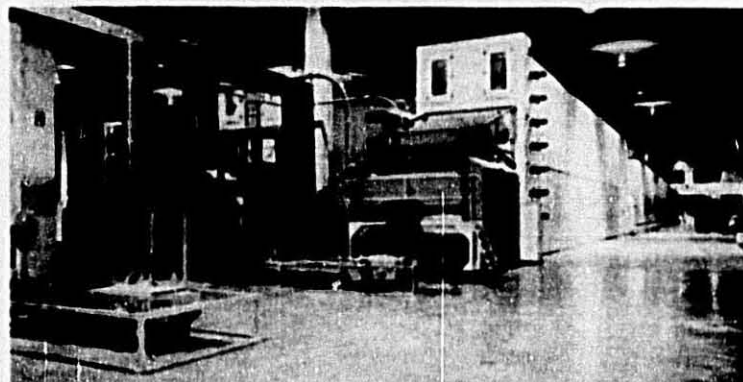
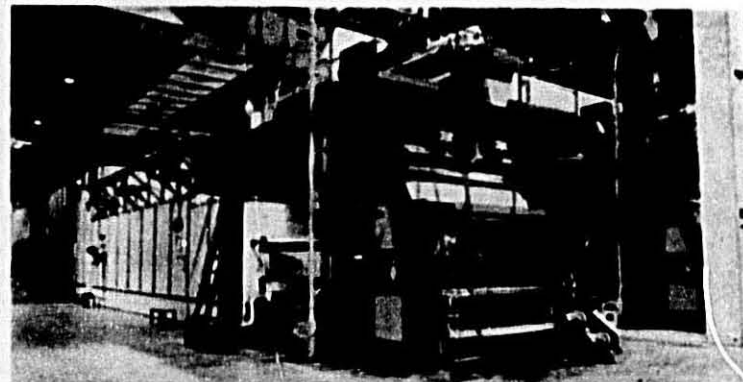


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113 of which 53 are for long pasta,  
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### Chesebrough-Pond's to Acquire "Prince" Tennis Racquet Manufacturer

Chesebrough-Pond's Inc. and Prince Manufacturing, Inc. have reached an agreement in principle for Chesebrough to acquire Prince, it was announced jointly by Ralph E. Ward, chairman and president of Chesebrough, and Howard Head, chairman of Prince.

The acquisition of Prince and all rights will be completed for Chesebrough common stock totaling \$62 million.

Chesebrough-Pond's is a diversified worldwide manufacturer and marketer of consumer products. Prince Manufacturing, headquartered in Princeton, N.J., manufactures and markets high quality tennis racquets employing a unique, patented design.

Mr. Ward stated, "This acquisition represents another step in Chesebrough's planned growth and diversification program. Prince is the fastest growing manufacturer of high quality, branded tennis racquets worldwide. Especially impressive is the fact that while the tennis "boom" has flattened since 1976, sales of the "Prince" racquet have grown dramatically from \$9.4 million in 1979 to \$34.9 million in 1981, and should approximate \$60 million for 1982. The acquisition is expected to have a positive effect on Chesebrough's earnings for 1982."

Chesebrough-Pond's Inc., headquartered in Greenwich, Connecticut, is a diversified worldwide manufacturer and marketer of branded consumer products for the entire family. Among the company's best known brand names are Ragu, Health-tex, Bass, Weejuns, Ponds, Adolph's, Vaseline, Cutex, Intensive Care, Cachet, Wind Song, Aviance, Chimere, Prince Matchabelli, Q-tips, Aziza and Rave. Worldwide sales for 1981 totaled \$1,529,674,000.

### Nabisco Chairman Elected to Head GMA

Robert M. Schaeberle, Chairman of Nabisco Brands, Inc., headquartered in New York City, was elected as Chairman of the Grocery Manufacturers of America, Inc. (GMA).

Schaeberle succeeds outgoing Chairman James L. Ferguson, Chairman of General Foods Corporation, White Plains, NY.

GMA is the trade association representing the leading manufacturers of food and other grocery products sold in retail outlets throughout the United States. Sales of GMA members exceed \$200 billion annually.

Also elected at GMA's Board of Directors meeting were:

Vice-Chairman: John H. Bryan, Jr., Chairman of Consolidated Foods Corporation, Chicago.

Treasurer: William E. LaMothe, Chairman of Kellogg Company, Battle Creek, MI.

Secretary: Eugene J. Sullivan, Chairman of Borden, Inc., New York City.

### New Improved Prince Spaghetti Sauce

The Prince Foods Company is introducing new improved Prince Spaghetti Sauce with a two stage TV campaign created by Venet Advertising, Inc. of New York.

The first :30 commercial highlights the new label design, the changes in the ingredients and introduces the campaign theme, "What's in New Improved Prince Spaghetti Sauce is really Italian; the taste'll tell you that".

The second commercial compares the ingredients of New Improved Prince Spaghetti Sauce with those of other leading sauces, highlighting the ingredients in the other sauces that don't belong in a real Italian Spaghetti Sauce. The spot stresses the all-natural real Italian ingredients in Prince, and wraps up with the campaign theme, "So what's in here really is Italian, the taste'll tell you that".

The two spots will run in the entire New England region with upcoming schedules in the balance of established Prince markets, as well as new markets in the Northeast.

### Multifoods First Quarter

At its Annual Meeting International Multifoods announced record earnings for the first quarter ended May 31, 1982.

Net earnings for the period were up 22 percent at \$5.3 million or 64 cents per common share over last year's record first quarter of \$4.4 million or 53 cents per common share. Sales were \$259.7 million, a decline from sales of \$279.4 million for the first quarter

a year ago, principally reflecting the effect of lower commodity prices on selling prices.

Multifoods' president and chief operating officer, Darrell Runke, reported that "Once again we are benefiting from balanced geographical operations, as strong operating results in Venezuela more than offset continuing sluggishness in the U.S. economy and a softening in Canada. Lower interest costs and a gain from partial settlement of an insurance claim also contributed to our overall earnings improvement."

Advances in the Consumer and Agriculture market segments were attributed primarily to outstanding results in Venezuela. Cited by Runke as "bright spots" in relatively unchanged U.S. consumer operations were "improved results from Feinberg/Reubes specialty meats through expansion of national accounts, and a strong performance from our newly-acquired All American Nut operation."

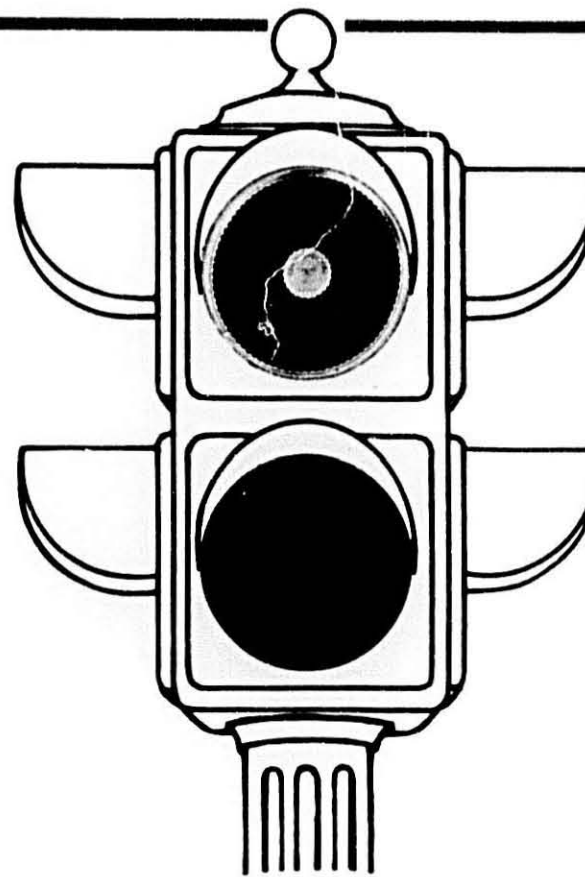
Earnings in the Industrial market segment were down despite a fine Venezuelan performance. According to Runke, "the entire U.S. flour industry is suffering from depressed flour margins and our operations are no exception. A substantial decline in Canadian export volume also affected results for the quarter."

A decline in customer counts in the U.S. and development costs of Canadian operations led to a slight earnings reduction in the Away-From-Home Eating segment.

William G. Phillips, chairman and chief executive officer of Multifoods, said "We are facing an unusually high degree of unpredictability regarding the U.S. and Canadian economies in the months ahead. Nevertheless we are confident that our demonstrated balance, flexibility and improved productivity, will maintain Multifoods' consistent performance through the remainder of the year."

In action taken at the Annual Meeting, stockholders reelected eight incumbent directors and approved a plan which will provide common stockholders with an opportunity to report receipt of a portion of the year's cash distributions as capital gains rather than as dividend (ordinary) income.

Multifoods recently announced an eight percent increase in the dividend payable July 15, 1982 to record holders of common stock as of June 28.



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### Thomas Kerr Dead

Thomas Kerr, 72, chairman of Kerr Pacific Corp., Portland, and a long-time leader of the Pacific Northwest grain industry, died Thursday, May 13 at the home in Portland after suffering a stroke.

Mr. Kerr was born in 1910 to a pioneer Portland family. His father, Thomas Kerr Sr., was founder of Kerr, Gifford and Co., a grain-exporting business, along with his brother Peter. The two Kerrs had come to the U.S. from Scotland late in the 19th century. His mother, Mabel Kerr, was the daughter of Portland pioneer, Donald Macleay, founder of U.S. National Bank and also a successful grain merchant. Mr. Kerr began working for his father's company as an office boy in 1932 after graduation from Yale University.

He was active in both the domestic and export grain markets as the company grew from a local operation to the largest grain company on the Pacific coast.

### RHM Expands U. S. Operations

RHM announced the completion of its purchase of Western Food Products, based in the American Midwest. Western Foods, operating from four factories in Colorado and Kansas, produces bottled dill pickles, tomato ketchup and mustards. RHM said that the acquisition of Western Foods further strengthens the profitable group of food companies which the group has bought in the U.S. over the past seven years. It is the third acquisition in six months, the other newcomers being Lyndonville Canning Co., Lyndonville, N.Y., the old established applesauce manufacturing company purchased from The Pillsbury Co., and Hudson Valley Apple Products in Milton, N.Y., which produces apple juice, applesauce and other apple products. In addition to the plants just acquired at Lyndonville and Milton, RHM has four other plants processing apples into a variety of consumer products in the U.S.

Five other RHM plants in the U.S. produce another important food product — pasta. These are at Rochester and Buffalo in New York; St. Louis, Mo., Chicago and Seattle. In September 1981, RHM began a \$5 million in-

vestment to extend the Buffalo plant. The pasta companies are directed from Buffalo by RHM Macaroni Inc. RHM is, of course, the largest U.K. pasta manufacturer.

Overall control of RHM companies in the U.S. is by RHM Holdings (U.S.A.) Inc., in Northfield Ill., headed by RHM PLC main board director, J. Malcolm Semple. Sales in the current financial year, excluding the three new acquisitions, are estimated to exceed \$100 million.

### Wheat Industry Council Budget

The Wheat Industry Council budget for a nationally coordinated wheat and wheat foods research and nutrition education program will be \$700,000 in fiscal year 1983, a U.S. Department of Agriculture official stated.

Thomas H. Porter, an official of USDA's Agricultural Marketing Service, said the budget for July 1, 1982, through June 30, 1983, features a consumer nutrition education program which will use national and regional spokespersons to tell the public about the nutritional value of foods containing wheat.

Porter said the program was authorized under the Wheat and Wheat Foods Research and Nutrition Education Act and is conducted according to an order approved in March 1980 by wheat end product manufacturers. It is financed with funds collected by assessing manufacturers of wheat and products.

The Wheat Industry Council prepares the budget and administers the program. Council offices are located at 6000 Executive Blvd., Suite 203, Rockville, Md. 20852.

Under the program, assessments of 1 cent per hundredweight — 45 kilograms — of wheat bought by end product manufacturers began to accrue June 1, 1981. Manufacturers can receive refunds of assessments paid during the coming year. They must, however, reserve the option to request refunds by notifying the council by registered or certified mail within 60 days of publication of the council's budget in the Federal Register.

The budget was published in the April 30 Federal Register.

### W.I.C. Budget

The Wheat Industry Council budget for fiscal year 1983 has appeared in the Federal Register.

\$700,000 of assessments are expected as income.

Expenditures contemplate a national spokesperson with placement in five major markets at \$47,500.

Eighteen to 20 regional spokespersons with three media appearances each and development of audio-visual materials for use by spokespersons \$77,000.

Nutrition education literature: \$55,000.

Press materials and conferences: \$33,000.

Radio vignettes, 2½-3 minutes in length, 12 in number: \$23,000.

Mat releases, daily and weekly newspapers: \$39,032.

Press Clippings: \$3,000.

Agency, nutrition consultants, advisors, free-lance writers and media placement: \$58,000.

Industry relations including quarterly newsletter: \$22,000.

Compliance and administrative expenditures: \$281,468 including USDA charges of \$80,000.

Loan repayment: \$61,000.

Total expenditures: \$700,000.

### Block Names Three Members to Wheat Industry Council

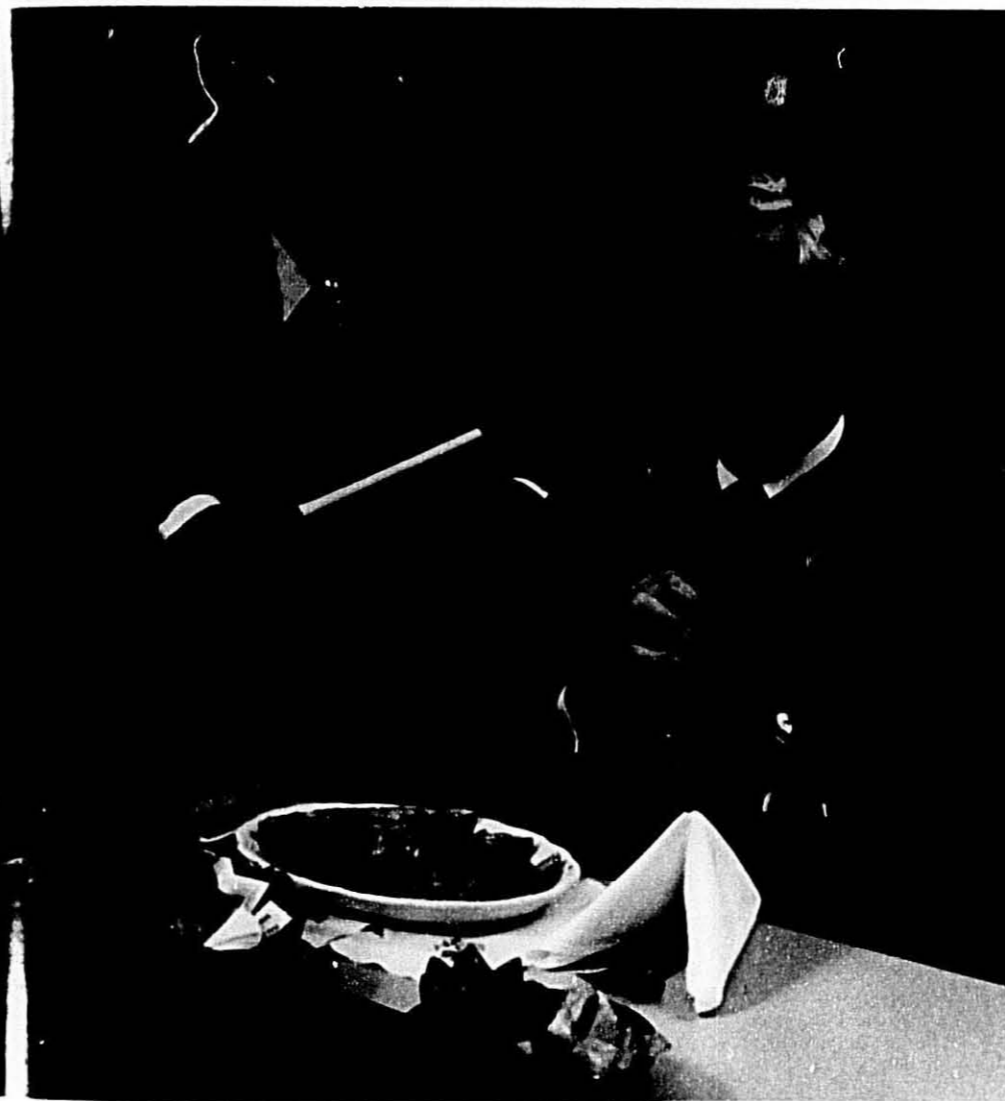
Secretary of Agriculture John R. Block has appointed two members and one alternate to serve on the Wheat Industry Council, which administers a national research and nutrition education program for wheat and wheat foods.

New members are Gordon Smith III, president of Smith's Baker Mobile, Ala., and John E. Kinsella, chairman, Department of Food Science, Cornell University, Ithaca, N.Y. Block named Anthony H. Gioia, president of RHM Macaroni, Inc., Buffalo, N.Y., as an alternate member.

Block said the new appointees will serve the remaining portion of terms which expire at the end of 1983. The three positions became vacant when previous appointees were unable to serve.

(Continued on page 12)

THE MACARONI JOURNAL



Perfect pasta makes a great case for a good stuffing.

Judge for yourself. No matter what people stuff inside manicotti or ravioli, the pasta just won't hold its own unless it's nutritional, good-tasting and economical.

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At Amber Milling, helping you prepare a great pasta for your customers' stuffings is a matter of record. Need proof? Next time you order, specify Amber. Then you be the judge!

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## Durum Wheat and Pasta Products

Early experiments indicate no adverse effects from strong gluten durum wheat varieties on North Dakota wheat quality or milling performance. Dr. B. J. Donnelly, North American Plant Breeders, Berthoud, Colo., said at the spring technical conference of the American Association of Cereal Chemists' Milling and Baking Division in St. Louis. In a paper on "Durum Wheat and Pasta Products," Dr. Donnelly emphasized the importance of semolina protein quantity for the production of pasta products and observed that recent release and commercial production of two durum wheat varieties — Vic and Edmore — have focused attention on the gluten quality aspects of the protein.

### European: Now Demand

Earlier research in Canada and the U.S. had shown that spaghetti processed from strong gluten semolina of acceptable protein content improved cooked firmness and tolerance to overcooking.

"These superior cooking characteristics are in demand in the European export market," he said.

"In the past, potential U.S. exports have been lost to Canada or Argentina because of the higher gluten strength of their varieties. The improved cooked firmness values of Vic and Edmore when compared with two standard weak gluten varieties — Rugby and Calvin — (were indicated by the data)."

Dr. Donnelly pointed out that this past year Vic and Edmore comprise 13% of North Dakota's durum wheat crop.

### Vic Looks Good

"These, particularly Vic, are expected to increase to approximately 25% in this coming crop year," he said.

"With the anticipated continued swing toward increased production of strong gluten wheat, and the expectation that they will predominate in the crop in five to eight years, a simple experiment was performed to determine the potential impact of such wheat on the quality of future North Dakota grown crops."

The test involved blends of Edmore and a typical weak gluten North Dakota wheat.

"No adverse effects were noted on wheat quality or milling performance,"

he said. "In fact, a slight improvement in milling performance was noted when the blend contained 50% or higher of Edmore. A 50% or higher blend of Edmore was also required to produce gluten strength (micromixograph) scores in the strong category."

Observing that no particular problems were encountered in processing the blends into spaghetti, he added that blend levels of 50% or higher Edmore were required to provide spaghetti with improved color scores and cooked firmness values. Blending had no adverse effect on cooked weight or cooking loss.

Dr. Donnelly added that indications are, therefore, that the durum wheat crop from North Dakota will probably contain at least 50% of the strong gluten type in the wheat mix before improved quality effects are noted, particularly with respect to color and cooking quality.

Recent industry evaluation of Edmore through the commercial pasta extrusion process confirmed the absence of undue processing and drying problems associated with strong gluten. He said there was less breakage of the dry product on the cutters, particularly with lasagne. While some manufacturers said it was not uncommon to see 15%, 20% or 25% breakage or splitting of the lasagne during the cutting process, "with Edmore breakage was less than 10%."

### Superior Cooking Quality

He added that "cooking quality evaluation of the commercially processed spaghetti by 40 individuals or firms reported the superior cooking quality of the strong gluten product."

Dr. Donnelly pointed out that "it is generally accepted in the U.S. that semolina from durum wheat is the raw material of choice for producing the highest quality pasta products."

He observed that "the fact that pasta products made from durum semolina have better cooking stability than similar products made from some bread wheat relates to the generally higher protein levels usually attained in durum wheat." He added that this was particularly true of the durum from the traditional durum producing states of North Dakota, Minnesota, South Dakota and Montana and less so in the southwestern states of Arizona and California.

He also observed that another feature of durum wheats that adds to the

wheat's uniqueness relates to protein composition. A comparison of albumin, globulin, gliadin, gluten and residual protein fractions with those in hard spring wheat shows that durum generally are lower in albumin, higher in residual protein content than in bread wheat counterpart."

### Protein Levels

Protein levels in durum wheat should be in the 12% to 15% range (14% moisture basis) for high quality pasta production. Protein in semolina will normally be 0.5% to 1.5% lower than the parent wheat. "Consequently low protein wheat will result in semolina with correspondingly lower protein which can result in pasta processing problems. Macaroni is normally processed or extruded at a relatively fixed absorption of 30% to 31.5% moisture. Higher starch levels in low protein semolina will change the absorption characteristics of the dough prior to extrusion. This may require adjustments in the water metering system resulting in disruption of production schedules. In addition, production of a uniform product may be more difficult, and spaghetti drying may be a problem due to strands falling off the rods in the drying process."

"Speck count" is another problem. High speck counts can result from improper cleaning and milling of the wheat or improper purification of the semolina on the purifiers. He added that the presence of diseased wheat (ergot or black point) also may be a problem.

### Wheat Industry Council

(Continued from page 10)

The 20-member Wheat Industry Council is composed equally of wheat producers, processors, end-product manufacturers and consumers.

The U. S. Department of Agriculture's Agricultural Marketing Service monitors the wheat and wheat food program and reviews its budget plans and projects to ensure that the program operates within the law.

### International Durum Forum

The International Durum Forum will be held in Minot, North Dakota, November 11-12. The Ramada Inn will be headquarters hotel.

The event will commemorate the twenty-fifth anniversary of the establishment of the U.S. Durum Wheat Growers Association.

North Dakota Mill is one of the top mills in the nation for many reasons! Leo Cantwell, marketing director, is proud of the fact that only the most modern milling equipment is used to mill the finest, highest quality durum wheat in the world.

Superior laboratory and testing facilities assure you of quality control.

Your macaroni products will be the best when you start with durum products from North Dakota Mill.

One of our top priorities is to back our products with responsible, personal service. Jane Rowland and Kathy Hjelden take great pride in handling and processing your orders through our customer sales center.

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important to us. That's why at North Dakota Mill, we deliver service.

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# We Deliver Service.





# MIXING AND EXTRUDING

by Felix Gruenenfelder, Manager, Macaroni Division, Buhler-Miag, Inc.

Real industrial production of pasta products is relatively new, but has developed in the past few decades to a highly sophisticated, technical industry. The introduction of the continuous operating screw extruders in the 1930's was the first giant step towards fully automated processing lines. First, hand-made products, then spindle presses and later large hydraulic driven piston presses were the steps to today's efficient and sanitary extruders, operating at capacities of 100 lb/hr. up to 15,000 lbs/hr. The latest change from one step to another had just been completed when realizing that up to 1972, hydraulic driven piston presses were still in operation.

## Improved Quality

Has the quality of the final products improved at the same time that machines were automated and made larger? Yes, if considering sanitation, contamination, color, shape and consistency. In regards to taste or "bite," connoisseurs are still considering a hand or semi-automatic made product better. A sheeted noodle is different in structure (bite), but considering the total output of pasta products, it is an insufficient amount. A careful operation of today's new machines is the manufacturer's assurance to economically produce a clean, good-looking product, consistent in shape and texture.

To cover some of the more important aspects of mixing and extruding in the pasta industry, we have to consider:

- raw materials
- ingredients
- feeding systems
- mixing components
- vacuum
- extrusion elements
- forming of products—dies.

## 1. RAW MATERIALS

The wheat grown in different parts of the U.S. and the world are subject to a wide spectrum of different climatic and agricultural conditions. There are also differences in quality, so much that the type of wheat used has a considerable effect on the quality of macaroni produced from it.



Felix Gruenenfelder

Nevertheless, it is important to realize that a first-class raw material can be converted into a first-class final product. Mixtures of different raw material components in connection with careful production may also result in an excellent final product. Inferior raw materials may show up in a product with bad cooking qualities (sticking, sliminess), bad color and taste.

## Granulation

The old saying is that a coarse durum semolina will produce the best pasta product. In the past, small manufacturers were unable to analyze the material they received from the mill. Therefore, the coarse raw material easily checked for specks and ash content, was their best assurance to obtain what they required. Special batch type mixers and "gramola's" allowed ample time to prepare a homogeneous dough. The theory of "coarse" semolina had its merit.

Changes in the mixing and extrusion process such as continuous, more rapid but shorter mixing, vacuum systems, highly efficient kneading components as well as teflon inserts in dies, changed the raw material requirements to some extent.

We have to note:

- coarse semolina is hard to process into a homogeneous dough, due mainly to the extended time required by the water to penetrate the individual semolina grains,
- finer semolina and flours absorb the water quickly, readily lending them-

selves to mixing into a homogeneous dough.

This allows us to draw the conclusion that, irrespective of the size of the grains, the particle size range should be selected as narrow as possible; or, in other words, that coarse semolina and flours should never be processed together. This would otherwise result in the finer raw material absorbing the available water more quickly than the larger size semolina particles, with the result that the mixing time would be significantly extended or that it would be impossible to produce a homogeneous mix. The result would be "white specks" in the end product. To eliminate these, the kneading process during extrusion would have to be more intense, entailing greater heat development and so affecting the cooking quality of the end product.

## Moisture Content

To operate extruders with a minimum of supervision as well as to achieve an even extrusion pattern, the moisture content of the raw material should be most even. The moisture absorption time of a "dry" semolina and/or flour (e.g. 10%) is considerably longer than for a "wet" raw material at 14% to 15%. The miller can operate his plant most efficiently when grain has a higher moisture content. However, for shipping and storage, too high a moisture content might cause problems (caking, bridging, uneven discharge). Pasta plants directly connected to a mill, therefore are blessed with ideal mill operating conditions, short storage time and a relatively "wet" product for their high capacity processing equipment.

In general, the pasta manufacturer has no chance to influence the moisture of his raw materials. To layers in rail cars standing in the sun for days and weeks will dry out. The same effect occurs on products stored outside in large bins. To minimize the influence of such irregularities, it is highly recommended to mix raw materials out of two to three bins at all times. If regrind is used, carefully blend the same amount of this component at all times.

## 2. INGREDIENTS

Besides water, egg products are very often added to the raw material. The question of egg slurry (soup) or dry egg powder is still the debate. Judging by new installations, the tendency clearly favors the dry egg powder feed system. Color and cooking quality remain basically the same for final products made with either additive.

Sanitary requirements, ease of operation and control are clearly favorable to the egg powder. Contamination of this powder in the dry stage is minimal, even in the warm press-room environment. Nevertheless, manufacturers have to realize that "free-flowing" egg powder has to be used for a flawless operation. Such powder has to be stored in cool rooms (40 degrees F) and used within approximately eight weeks after purchase. The free-flowing agent will dissipate or at least lose its characteristic to keep the egg product from caking and sticking. For an even distribution of egg powder to the flour, we strongly recommend a pre-blender before the water is added to assure an even distribution of the additive.

The use of egg soup results in a slightly lower capacity due to the prolonged absorption time.

In regard to the water used, we note that warmer water helps to shorten the absorption time of the semolina. A provision to use "warm" mixing water should be provided. As a rule, never use water with temperatures above 90 degrees F and during a production run, use water of the same temperature at all times. Warm water might also be recommended during the winter time, especially when semolina is stored outside.

## 3. FEEDING SYSTEMS

The press feeding system consists in general of the following components:

- storage bin—discharge
- mixing and conveying to press bin
- feeding into press.

Raw materials out of different bins and/or different components should be mixed at all times. Differences in moisture content of the components will even out and assure a press operation with a minimum amount of supervision. Changes in the mix pattern can be realized by moisture changes of 1%

which will also influence the extrusion pattern. Special attention has to be paid to the addition of regrind, a second quality of raw material (with a moisture content normally far below the other components). Careful mixing of regrind at a rate of up to 10% will not influence the final product provided it is added at an even stream and in general meets the same granulation specifications as the other components.

## Press Feeders

Most important are simple and sanitary feeders, working reliably under all conditions. Scales, the most accurate of all feeders (if adjusted and operated properly), are not often in use. Special problems are sanitation and installation (vibration from mixer).

A most ideal feeding system is offered with a simple screw feeder mechanically connected with a positive displacement pump for liquids. To equalize varying pressures of flour to the screw due to varying levels in the press bin, or to assure proper de-aeration of flour in continuous feeders, a special feeder-hopper should be provided. A positive, even filling of the feeder screw is essential.

For the liquid feeder, the same laws apply. An even pressure to any metering device is necessary. Fluctuation in city water systems should be compensated with regulators or feed tanks. A positive displacement pump driven by the same drive as the flour feeder allows adjustments of the capacity with one single control knob. Any fluctuations of the drive will influence the two feeders equally. Still, a special adjustment capability of the water feed is necessary to correct uneven moisture contents of the raw materials. In pumps, the stroke adjustment will accomplish this task.

## 4. MIXING OF COMPONENTS

Mixers cannot be built with unlimited dimensions to guarantee a top mixing job under all conditions. In new machines, mixers are designed to operate at relatively high speeds to achieve a good result under normal conditions. For high capacities, premixers are required.

An even mix is essential to achieve a nice product with a smooth surface. The mix has to be free of lumps (lumps generally have a wet or dry

center, uneven moisture distribution). Product build up on mixer walls, especially at the infeed section, has to be kept to a minimum. Such build up causes problems such as wet lumps, bacteria contamination and even mold. Mixer walls, specially designed in new machines to minimize product hang up, should be cleaned (scraped off) at regular intervals. Easy accessibility of mixers helps to accomplish this task.

The moisture content of the dough depends on the product to be produced. Wet dough has the advantage of a better product surface but may result in deformation of the final product.

Uneven feed of components or uneven moisture distribution shows up quickly in the mixer. Moisture changes of 1% can be noticed immediately by a trained press operator. Careful corrections at the feeder are required to adjust such changes. Additions of flour or water (with bucket) into the mixer have to be avoided at all times. A fully automatic operation cannot be achieved with such practice. A properly designed press-feeding system (including flour mixing), will prevent such happenings.

## To Control Mixer Level

To control the mixer level, two systems operate successfully: one is with a "sound" level control, the other with a simple amp-meter of the mixer drive. If the mix stays very constant, the amp-meter control can be recommended whereby high amperage equals high mixer level or shut down of feeder. Low amps—low mixer or start up of feeder. Such an operation needs a minimum amount of supervision and guarantees a good final product.

## 5. VACUUM

There are several vacuum systems on the market. All have one thing in common—to de-aerate the product before kneading and extrusion. It is necessary for two reasons:

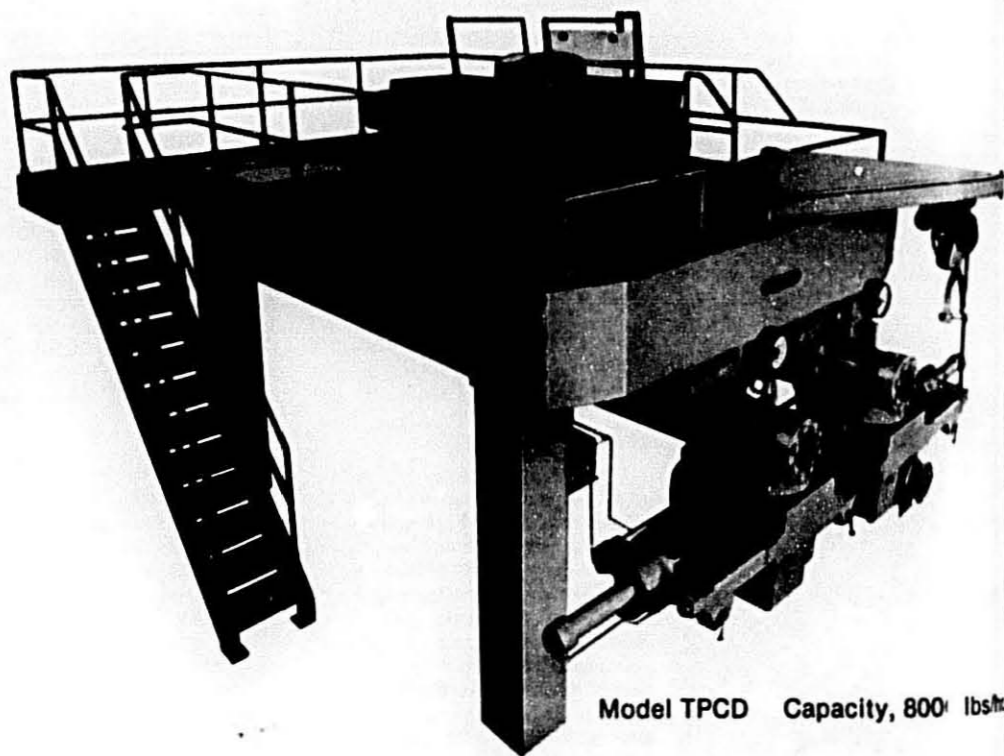
- a) the de-aerated product is more compact, transparent and therefore more appealing in color.
- b) high temperature drying and microwave drying require a high vacuum. Even the smallest air enclosure expands rapidly when exposed to higher temperatures.

(Continued on page 18)



# BUHLER-MIAG® EXTRUDERS

## Performance You Can Depend On!



Model TPCD Capacity, 800 lbs/hr

Eight Models — Capacities from 50 to 16,000 lbs/hr

Model	Lbs./hr. Capacity
TPLE (Single Screw) Lab Extruder	50- 300
TPAE (Single Screw)	660- 1,320
TPAD (Double Screw)	1,320- 2,640
TPBE (Single Screw)	1,000- 2,000
TPBD (Double Screw)	2,000- 4,000
TPCE (Single Screw)	2,000- 4,000
TPCD (Double Screw)	4,000- 8,000
TPCV (Four Screw)	8,000-16,000

*We can help your profit picture, regardless of your plant size.*

### Sanitary Design

Structural Members completely enclosed; can't collect dust or dirt.

Motors and Drives are open, away from product area and easy to service.

Drive Guards are completely enclosed in oil baths for chain drives. Belt Drive Guards are open at bottom, to prevent dust and dirt accumulation.

One-piece Unique Trough Design has smooth rounded corners for easy cleaning. Product hangup on mixer walls is virtually eliminated.

Outboard Bearings on mixer shafts absolutely prevent product contamination by lubricant. Seals may be replaced without removing bearings or shafts.

### Easy Supervision and Operation

Mixer Cover has plexiglass window for easy inspection.

Variable Speed Drive with remote control for accurate capacity adjustment.

Time-Saving Hydraulic Die Change Device.

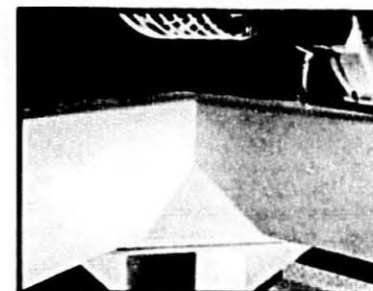
### Robust Construction

Time-Proven Design assures long, trouble-free extruder life.

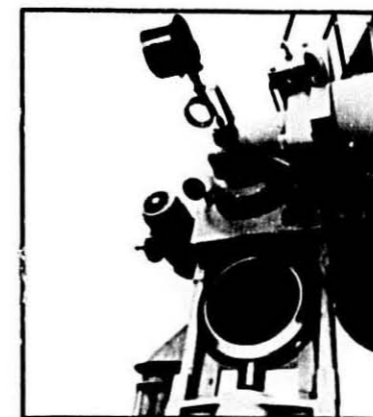
Reliable U.S.-built Drive Components selected for low noise operation.

### Product Quality is What Really Counts!

High-grade quality is yours from BUHLER-MIAG equipment. Your customer recognizes and deserves it. Can't afford to give him less?



Press base and belt guard reflect the clean, efficient design and attention to detail in every Buhler-Miag press. Base is sturdy and easily accessible. All joints have smooth welds for easy cleaning.



Head for round dies: 15 1/4" (400 mm) diameter, with hydraulic die change device (Single screw extruder).

Contact us for information on BUHLER-MIAG Extruders and other Macaroni Processing Equipment.



# BUHLER-MIAG®

BUHLER-MIAG, INC., P.O. Box 9497, Minneapolis, MN 55440 (612) 545-1401  
BUHLER-MIAG (Canada) LTD., Ontario (416) 445-6910



## Mixing and Extruding

(Continued from page 15)

The most common vacuum systems in use are:

—mixer-vacuum (main mixer or separate vacuum mixer)

—vacuum-chamber built into extrusion components.

Both systems fulfill their purpose. The advantages and disadvantages of each system are:

### Mixer-Vacuum Systems

To de-aerate a loose mix, the vacuum applied can be at a "lower pressure" than for a compacted product. Mixer vacuum systems work most effectively at 18 to 20" mercury. Still, with the relatively complicated infeed of components via an airlock, all the seal areas of the mixer (cover, shafts) and the feed into the main screws require a "high air flow." Pumps (drive and seal media) as well as the piping have to be sized accordingly. Maintenance is high and energy consumption is up to three times higher than for a simple "screw" vacuum.

Nevertheless, other advantages including possibilities of building extruders for high capacities (up to four extrusion screws) justify this system.

### Screw Vacuum Systems

The mix is slightly pressed and compacted in the feed screw. At the infeed end of the main screw, the vacuum is applied. To obtain the necessary vacuum effect on the product, slices have to be cut from the "compacted mix" or a thin wall dough has to be de-aerated. A high vacuum is essential but due to the small seal areas, systems operating at 25 to 27" mercury are obtained with small pumps. Easy supervision and minimum sanitation and maintenance requirements make this system favored.

## 6. EXTRUSION ELEMENTS

In the extrusion elements, the mix will be transported to the extrusion head, pressure is built up to push the dough through the die openings and the mix is kneaded to a homogeneous dough. Energy is needed to fulfill all these tasks. From the main motor, energy used is approximately:

- 10% to move product
- 6% to build up the pressure

up to 60% to knead and mix the product

up to 24% is used in mechanical components (motor efficiency, friction of gears, belts, etc.)

The high energy input into the dough will result in warm up of the product and, if not controlled properly can be a major cause of gluten destruction, which starts at a temperature of 125 degrees F and results in bad cooking quality. The most ideal dough temperatures are between 104 and 122 degrees F. Dough that is too cold has a lower viscosity and therefore the extrusion pattern changes. It is, however, imperative that part of the product heat is carried away with a cooling medium. All screw extruders are therefore equipped with "cylinder cooling."

### Most Efficient Cooling

The most efficient cooling of dough via a cylinder wall can be accomplished with water of approximately 70 degrees F. This "lukewarm" water has to be flushed through a cylinder at a relatively high speed to achieve the desired cooling effect. A pump is necessary with a regulated water system.

Why lukewarm water for cooling and not cold water from the well? Dough is a good temperature insulator. Too cold a cylinder will build up a film of dough along the wall, increasing the friction factor and causing an irregular extrusion pattern.

The cylinder walls in a new extruder are machined extremely smooth to minimize friction and dough build-up along the walls. Due to the large contact area of dough along the screw, the dough has a tendency to turn around with it resulting in uneven extrusion length of product. (In the worst case, no extrusion at all.)

To eliminate the "pumping" effect, longitudinal grooves are cut into the cylinder wall. This is the only solution to keep the dough pockets from turning and keep them in a straight forward movement.

Cylinders will wear out with time, grooves will disappear (especially in the front part). A loss in capacity of the machine can be realized (high back flow of product) as well as short and long products only show up, especially when "wet dough" or "egg dough" is

produced. Regrooving or better placement of the cylinder is the answer.

The extrusion screw is the most important component in the machine. Movement of the dough, pressure build-up and kneading are the "job" of the screw. The continuous constant volume winding of the flights around the core should move the product (theoretically) with each revolution the length of one pitch towards the press head. Friction and kneading however will hold the dough back. The moving of the dough under pressure creates a circular motion within the pockets whereby the front part of the flight does the major part of the kneading. To minimize friction, the core as well as the back side of the flights are teflon coated. Minimized friction = minimum head build up. Nevertheless, due to the fact that the screw is not cooled and because of dough friction along its flights, there is a considerable temperature difference between the product along the cylinder wall and the screw core. Flight interruption (especially in the front part of the screws) helps to mix and level out temperature differences and assure an even extruded pattern.

### Sensitivity to Shear Forces

Dough is extremely sensitive to shear forces. In any friction area, shear forces are produced. The highest shear force occurs at the circumference of the screw. Too much clearance between cylinder and screw results in a large dough flow back exposing more product to the high pressure zone. The main screw also has to turn faster to get the same capacity out of the cylinder. Higher revolutions at the same capacity need a higher energy input and consequently turn out a harder dough. The clearance between screw and cylinder should be kept at a minimum; the capacity of the extruder produced per screw revolution at maximum.

How can one see the influence of "high" temperature extrusion? Only micro-section photographs will show details. The result, however, can be realized at once in a cooking test.

## 7. FORMING OF PRODUCT

The extrusion heads for short cut products as well as the distributing manifolds for long goods are designed to:

- provide back pressure for a good kneading effect
- provide best possible distribution of dough over total die area
- minimize friction for even dough temperature and good extrusion pattern

The back pressure is guaranteed by the thrust holding the dough in the main cylinder (as well as by the die). Change in flow directions from horizontal to vertical is achieved at the same time. The pressure in the main cylinder raises with each screw flight and may reach up to 120 atm at the extrusion head.

### Teflon-lined Cone

The cone or chamber above the die is teflon lined to minimize friction. Cooling is normally not provided. To minimize temperature differences of dough during start up, long goods tubes quite often are equipped with heating chambers. The extrusion pattern however cannot be corrected effectively at this stage.

Dies & Filter Plates: at this stage, it is important to know that filter plates may help to equalize the extrusion pattern. Due to the additional friction, a higher back pressure may occur cutting down on the capacity of the extruder. Screens on top of the die are necessary to prevent any hard particles from plugging the die outlets. Some corrections on a bad extrusion pattern can be accomplished by use of double layers of screens.

The type of products are made by the die extruder has no influence. A clear die is an absolute necessity. Dies should be warm when inserted for start up.

## Europeans Buy High Temperature Dryers

Buhler's Miag has furnished high-temperature long-goods lines for Weilenmann in Winterthur, Switzerland, the Capa Company in Chur, COOP Schweiz in Morges, and Cisac in Cresier, Switzerland.

The Manzani Company in Lyons, France, will install a 2000 kilogram per hour long-goods line in the company's Nanterre plant near Paris.

The company of Capa in Tunis is installing a long-goods line for 1000 kilograms per hour.

AUGUST, 1982

## MICROWAVE PASTA DRYING

by A. L. Katskee, Microdry Corporation



A. L. Katskee

Just ten years ago the first microwave past dryer was introduced. Vincent DeDomenico, President of Golden Grain Macaroni Co., bought the unit, thought so much of its potential that he ultimately bought the company from Armour. Since that time with Vince's technical knowledge of pasta and Frank Smith's tremendous ability in microwave engineering, the pasta drying end of Microdry has progressed to the point that at the end of this year we will be processing over 400 million pounds of short cuts and noodles per year on Microdry equipment.

Today the only resemblance to that original Microdry unit is that it utilizes microwave energy. We have gone through an evolution of six generations of dryers where the first generation was just a pass of microwave and hot air and intended to be a finish dryer, only to be used as an auxiliary to conventional equipment. Although it was successful as a sheeted noodle dryer it left a lot to be desired for extruded short cut products. The problems were that the product got so hot and was drying so fast that it continued to dry after it came out of the microwave. The temperature and relative humidity differential and ambient was so extreme that there were many checking problems. Remember, Microdry is the original high temperature dryer. To overcome this factor, an equalizer was incorporated that held a high relative humidity condition (80%) to arrest the drying and allow the prod-

uct to cool from its 165°-170°F temperature to nominally a 100°-110°F. Today we don't dry over 34% in the equalizer. Another major problem encountered was that conventional predryers were not capable of drying the product low enough or evenly enough to overcome an inherent problem with microwaves and farinaceous materials which is that if the moisture content of the product is 20% or higher it will tend to cook rather than dry. Since some conventional predryers were only capable of drying to 19% and had as much variation as ± 5% across the screen we had to develop our own unit to dry more accurately into a lower moisture level. Our five-pass predryer today dries to a target moisture of 17½% with an accuracy of ± ½% across the screen.

### Danger With Predryer

As certainly most of you are aware, drying to this level in a predryer with conventional drying is practically suicidal. The product will be case hardened, the internal moisture will be trapped and you will ultimately have checked product. With the microwave, however, we have much greater tolerance in this area. Because the microwaves penetrate immediately to the center of the product and they develop a pressure gradient through the cross section of the product, the internal moisture is forced to the surface of the product. This is done with the microwave energy. The hot air then evaporates that moisture which is driven to the surface from the interior. This is why we can accomplish 4 to 6 hours of conventional drying in basically 12 to 15 minutes with microwave drying. The product is dried in the microwave section from nominally 17½% to 18% down to its target moisture in the microwave section. It then goes into the equalizer where it is cooled and the drying arrested as we discussed a little earlier. Incidentally, the whole drying process takes 30 minutes in the predryer and 15 minutes in the microwave for a total of 45 minutes, and then we spend another 45 minutes in the equalizer for a total elapsed time of 1½ hours.

(Continued on page 22)



# Peavey

## Sales Offices

Peavey Company  
10000 10th Avenue  
Minneapolis, MN 55426  
612-835-1000



## Microwave Drying

(Continued from page 19)

Time is one of the big advantages of microwave drying, because almost everyone wants to operate their plant on a 5 day 120 hours a week basis. If you compare running a microwave line against a conventional line that takes 8 hours to process you basically pick-up six hours of press time per week using a microwave dryer. This is 5.4% of really free production.

Several years ago we ran some energy audits with some of our customers on our dryers as well as conventional dryers. The results of these energy audits were that microwave basically used 25% to 40% less energy than conventional dryers. I realize that our competitors have not stood still with respect to their energy consumption and have done things to conserve energy. We have also done additional things to conserve energy, such as, we have added 25% to the insulation on our dryer and added a 1/2" thermal barrier on the metal-to-metal contact points. We have also added an airlock at the entrance to the predryer to eliminate heat losses through the opening. We quite frankly haven't been able to measure the energy consumption of these new dryers but we will as soon as we have the air systems insulated at the Golden Grain Chicago Plant you are going to see tomorrow. We estimate that our energy savings are probably another 15% to 20% over where we were.

### We Got Lucky!

Every once in a while a piece of blind luck comes your way and one such thing happened to us in respect to energy in that, totally unbeknownst to us, MIT was doing a study on this very subject that was financed by the Dept. of Energy. The result of the MIT study was that microwave is the only way to dry pasta. I realize that when we say it, it is one thing, but when MIT says it "Everyone Listens."

From a structural point of view our dryers are made entirely from stainless steel. The tracks as well as the structural members on the interior are even stainless. The air system on the exterior is heavy duty galvanized. The dryer has complete accessibility from a sanitation or maintenance point of view. One of our dryers can be cleaned in nominally six man hours. Just 24

## Microprocessors in the Pasta Industry

By Carl D. Cotten, Microdry Corporation

Today's expanding technology provides us with the opportunity to choose between good and better ways of doing something. Whether applied to our personal lives or to our business, the goods and services resulting from technological research have given us ever increasing choices.

In the "old days" control of industrial processing equipment was performed by relays. These electromechanical devices performed admirably (most of the time), especially when new, but they required a lot of space, extra power to energize coils, and did not lend themselves to easy systems expansion or changes. Their long term reliability was a function of how many time they were required to operate and under what conditions.

The programmable controller gives us a new and better way to perform these industrial control tasks. With its ability to perform simple relay logic, timing and counting, it has more or less made the electromechanical devices obsolete.

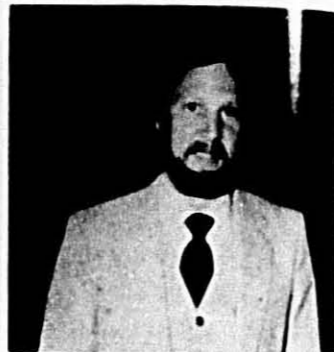
man hours for a conventional dryer. That is a \$100.00 savings everytime you clean the dryer at \$5.00 an hour.

From a space point of view you can get 3 to 4 times the production per square foot of floor space with microwave dryers. Our 4000 lb/hr is 31' long.

The product quality coming from a microwave dryer is equal to or better than conventional low temperature or high temperature dryers. We have run many comparative taste tests of product dried conventionally and with microwave, run from the same press only through a different dryer system. Never has anyone preferred the conventionally dried product. They may consider them equal or prefer microwave.

From a bacteriological point of view, the product is basically pasteurized as it goes through the dryer. In our hand-out, that you will get later, is a comparison of total plate count of product run on microwave and conventional dryers.

In conclusion we are essentially convinced that drying with microwaves is the only way to do it.



Carl D. Cotten

A typical P.C. can be divided into three components. These components are the mainframe, input/output (I/O) section and the programmer.

The mainframe contains the processor (the brains of the controller) and the DC power supply.

The I/O section is the main interface to the user devices, i.e., push button limit switches, motor starter, solenoid valves and etc. Discrete I/O are the most common, they are simply signals that are either on or off.

### Other Abilities

The processor also has the ability to interface and control numerical devices such as thumbwheels, numerical displays, high speed pulse counters and rotational shaft encoders and etc. Beyond the numerical I/O, digital meter, as an option the processor can interface with devices such as CRTs for video displays and teletype printers for printout. The processor will also communicate with inplant computers for gathering and storing information.

The programmer is a portable device that can be connected directly to the mainframe, and provides a simple method to program the processor from a ladder diagram. The language used to program the controller is familiar relay symbology, which is displayed on the CRT for convenient check-out and maintenance.

The advantages of using the P.C. are many.

- 1) One advantage is over all cost. The average cost of one relay with 2 inputs and 2 outputs in-

alled at today's prices, is about \$200.00 and in some areas this price can go higher. A simple P.C. can be purchased and installed in a much smaller area for about \$1200.00 and has 16 inputs and 16 outputs, or a net savings of \$400.00 on the 16. The percentage of savings are even greater with larger units. The P.C. can grow as your needs grow, with plug in modules and expanding memories in most processors. The unit can be expanded without having to build new panels to accommodate the addition of relays.

2) Secondly, troubleshooting: in most cases the system can be maintained, repaired or corrected from a small portable programmer plugged into the memory portion of the P.C. processor, and in many cases the system can be temporarily repaired until a more convenient downtime occurs.

3) Third, the CRT which displays simple relay symbology, makes troubleshooting a breeze for most plant electricians.

4) Fourth, reusability; if for some reason there is no longer a need for a certain piece of equipment that uses a processor, then that processor could be used on new or even existing equipment in your plant with a simple program change and some field wiring.

### System Bridgeview

The Microdry installed at the Golden Grain Plant in Bridgeview is a Modicon 484.

We selected this particular programmable controller because of its rugged construction, versatility, size and general adaptability for the industrial environment in which it is to be used. Other controllers have some of the features but not all. Examples are Westinghouse, which is a very rugged unit, but is much larger in size. To go the other way, Texas Instruments is a smaller unit and has good reliability but in my opinion does not have the construction for an environment that is not totally controlled.

The Modicon 484 System which is located in the Microdry control con-

sole, controls the Buhler press and microwave dryer.

The press portion of the P.C. controller provides us with both local and remote control. In this case the remote control is located in the control console in the main control room. Complete control can be accomplished from the main press panel, located at the head of the press.

A second panel located on the press near the premixer has control of flour, water, premixer and main mixer.

### Console Control

The console has the same control as the main press panel except for the cutter drive. The cutter is controlled only from the main press panel to insure proper product length. The console and both press panels have full graphic displays to indicate all switch and motor conditions, as well as RPM readouts for flour feed, transversal screw and cutter.

The local/remote control could have been accomplished by using simple relay logic but the number of hard wires and relays would have been astronomical.

At this time the processor is being used on an ON/OFF type control, but has the capabilities of adding total automatic control.

We hope to have, in the very near future, enough information gathered so we can determine where in the system to take measurements that will permit control without long lead or lag response times, and be able to incorporate the auto functions into the P.C.

The microwave dryer uses the programmable controller to its fullest, with either manual control or automatic.

The manual portion of the processor again is on ON/OFF control for the dryer. The operator must set the temperatures and humidities by using a standard Honeywell recorder controller, turn the system on by pushing a button for each function, and set belt speeds for the desired rates.

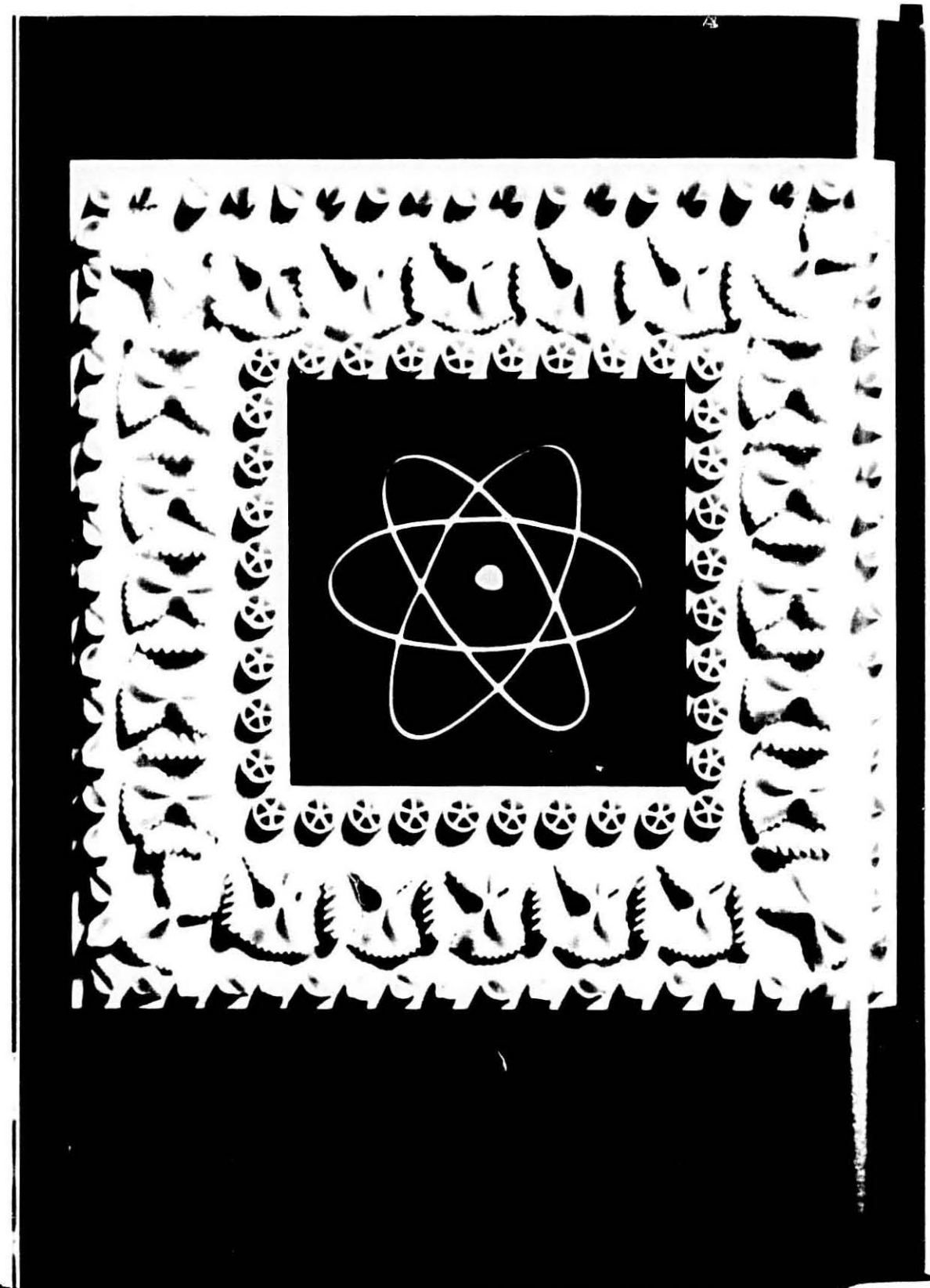
The automatic function has the capability of setting all dryer controls for four different products. This is accomplished by determining the screen and belt speeds, the proper temperature and humidities for each product, and entering this information into memory. This information will stay

there until the operator makes a change and enters that change into memory. Once this has been accomplished the unit is ready for total automatic control.

- 1) Select product desired.
- 2) Push control power on.
- 3) Turn on microwave power generator and set power to desired level.
- 4) Push start sequence button.

The processor will now take charge and start the dryer in a reverse interlock direction through the use of a sequencer in the processor. All this means is, the bucket elevator for discharging has to be on and running before the discharge conveyor can turn on. The processor will actually make two complete scans of the system to make sure all parts of the system are in their proper state before it will turn on anything else. This continues until the equalizer fans are turned on. At this time the processor will open the equalizer steam injection valve and start raising the humidity to the preset point, that has been stored in memory, for that particular product. The processor will continue turning on the predryer fans. When the predryer fans are turned ON the processor will then open the predryer steam valve and raise the temperature to its present point. The dryer is now ready for product. As the product enters the dryer, the humidity will start to rise. The processor is monitoring this at all times and will gradually open the dampers as it reaches the present level. As the product continues through the dryer and reaches the output of the last predryer screen, it is detected. The processor starts sequencing the microwave section of the dryer. Two timers in the processor are also started. One to turn the microwave generator on when product has reached the midpoint of the microwave dryer section and the other to time-out and sound an alarm when the product has reached the final output of the equalizer section. This is so a visual inspection can be made to insure good quality product.

The dryer will now do anything but make moisture checks for you, and it won't be long before this too can be accomplished automatically.



# Pasta is an art and a science.

## An art

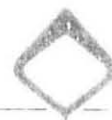
Pasta prepared in its many gourmet forms can be prepared in many ways. Some examples include:  
 Fettuccine Alfredo, Cavatelli, Alla Norma, Stuffed Manicotti, Ravioli, Alla Bolognese, Vermicelli, Spaghetti with Bolognese, Sicilian Chicken Sauce on Tortelli, Chicken Tortellini, Linguine with Clam Sauce.  
 The possibilities are an art.

## A science

Pasta is also an ongoing work of R & D. The scientific nutritional facts are that as a functional food, pasta is often a low-calorie, low-fat dietary contribution to the well-being of the active body. It is important as a source of energy, providing 40 grams of fiber, B, and iron. And as the grain shows, pasta is a good source of protein, iron, and calcium. It is also a source of fiber, iron, and calcium. It is a source of fiber, iron, and calcium.

	100 GRAMS EDIBLE PORTION				
	Protein (GMS)	Fat (GMS)	Carbohydrate (GMS)	Water (Percent)	Calories
Macaroni or Spaghetti	12.8	0.2	72.6	14.4	371
Tomato Paste	2.4	0.2	10.0	87.4	41
Tomato Puree	2.4	0.2	10.0	87.4	41
Chicken	20.8	1.0	0.0	78.2	165
Ham	21.2	1.0	0.0	77.8	163
Ham	21.2	1.0	0.0	77.8	163

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## BRAIBANTI PRESSES

by Luigi Grassilli, Braibanti Corporation

According to the program, the main topic to be discussed this morning is mixing and extrusion.

So, I will talk mainly of the BRAIBANTI presses. But in order to keep the commercial aspect to a minimum, I will try to avoid repeating too frequently the name of my company.

Our presses have been designed to meet the following requirements:

1. To maintain the levels of product quality that pasta manufacturers have come to expect from BRAIBANTI presses.
2. To meet present-day sanitation requirements and to make cleaning as easy and simple as possible.
3. To reduce maintenance requirements to a minimum and thereby reduce overall operating costs.

### Main Features

The main features of the presses are as follows:

1. Water and flour metering device: A volumetric doser is used for the raw material. A piston type doser or pump is used for the liquid. Both the flour and water dosers are driven by a single variable speed drive thus achieving both consistent and precise control of the raw materials being fed to the press.
2. High speed turbine pre-mixer. While a single basic design is used on all sizes of presses of the COBRA type, the pre-mixer on each size of press is proportioned to meet the output requirements of that press.
3. Double shaft mixing trough: Since the hydration step of the mixing process has already been carried out almost completely, the main function required of the double shaft mixer is to properly knead (and thus extend) the gluten of the dough coming from the turbine mixer.
4. Vacuum mixer: On each type of press this unit is of such size that it has sufficient capacity to insure the proper handling of the incom-



Luigi Grassilli

ing dough and to maintain a continuous feed to the extrusion screws.

5. Extrusion unit: Since the concepts employed in older type presses have proven their excellence in production over an extended period of time, these same design concepts are used in the present series of presses.

The COBRA type presses are all equipped with 2 cylinders and 2 screws.

### Characteristics

From the technological and operational viewpoints, the COBRA type presses exhibit certain characteristics which are of particular interest to the pasta manufacturer.

First, the quality of the product. It is known that the quality of the product is extremely dependent on the hydration and kneading action the dough receives in the mixing stage, and then on the further physical transformation that it undergoes during the compression and extrusion stages.

While kneading does require time to be effective, it can be extended to such an excessive degree that the gluten structure, having reached its maximum degree of development, begins to deteriorate. This development of the gluten, followed by its reaching and passing the breaking point, is a function of the gluten itself and it does not proceed at a uniform rate.

As opposed to this, gluten development does not begin until hydration has been accomplished. Thus, it is

apparent that the two functions should be dealt with separately, and as we noted previously, the primary function of the high speed turbine pre-mixer is to properly hydrate the semolina while the double shaft mixer is used only for mixing the dough.

Operationally, the high speed turbine pre-mixer micro-humidifies the dry material such that the starch component is thoroughly moistened and the gluten is then ready to start its development process. This is carried out in the double shaft mixer, and by using this two-step approach to the problem, the gluten is developed to its maximum degree, over mixing is avoided, and product quality is enhanced.

Flour dust in the mixing area is also greatly reduced.

### Sanitation

second, the problem of sanitation. Even the finest raw material obtainable is contaminated to at least some degree. Thus, in the presence of moisture, and with the passage of time, fermentation and bacterial and mold growth will take place. While the nature of the pasta production process is such that fermentation cannot be totally eliminated, it can be reduced to an acceptable minimum. This has been accomplished as follows:

1. Reducing the total time that the dough is in process between the dry raw material state and the time when it is extruded.

2. Elimination of all of those areas within the machine where partially mixed dough might become lodged.

Total mixing time has been substantially reduced by the high speed turbine pre-mixer since the hydration phase of the mixing process is now being carried out with equipment that was specifically designed to carry out this step in an efficient manner. In addition, the paddles of the high speed turbine pre-mixer have been designed in such a way that all internal surfaces are swept clean with each rotation of the paddles, and the entire inside surface is thus always completely clean. Thus, not only is the mixing time reduced but fermenting dough buildups are also eliminated.

### Water Micro-Dispersed

An extremely important secondary benefit results from the high speed turbine pre-mixing concept in that all of the water in the dough is micro-dispersed and is almost fully absorbed when the dough is delivered to the double shaft mixing trough. Thus, there is no "free" water to build up the slimy fermenting deposits found on the sides of most mixers.

In the double shaft mixer trough, these same improvements are employed and the bowls themselves have been designed to eliminate any dead corners where dough can lay and ferment. In addition, the two counter-rotating mixer shafts are supplied with a special oscillating device so that the walls will be constantly swept and thus also stay clean at all times. We call this system "alternate roto-axial motion."

The bowls of the double shaft mixer trough are somewhat smaller than before (since gluten extension is now the main function that is to be carried out here). The mixer shafts can be eventually pulled out for complete cleaning and sanitizing of the unit.

But—, to my knowledge, nobody does it—.

### Additional Features

Additional sanitation features of the presses are as follows:

1. The turbine pre-mixer has been designed such that its working components are accessible and easy to clean.
2. The structure of the machine (platform, ladders, frame, etc.) has been designed to insure better adaptation to function. Dead corners, that could become sanitation problems, have been eliminated, for ease of maintenance and cleaning, has been provided.
3. Naturally, all parts of the machine in contact with the product are of stainless steel or hard chromium coated, and all materials used in its fabrication have been specially selected for the function they must perform.

Summing up the above, we would like to state that our latest type of press is quite superior to the preceding one and that the already low plate count that pasta producers routinely

find in products from our older presses, has been even further reduced.

Now, according to the program, I should talk about extrusion and dies. I believe, however, that Mr. Maldari is much more knowledgeable in this subject and consequently I leave it to him.

Instead, I would like to talk briefly about the vacuum and express some observations and comparisons between the vacuum system adapted by BRAIBANTI a long time ago and the vacuum system used in other presses.

### Dough Transfer by Airlock

In our presses we transfer the dough and I repeat, the dough, from the main mixer to the vacuum mixer by means of an airlock, and the vacuum is applied only in the last stage of the mixing operation.

In other presses, the vacuum is applied during the complete mixing process.

Let us consider some phenomena which occur in regard to the vacuum: Some are chemical in nature and some are physical and operational.

Semolina, and raw material in general, contain some pigments, yellow in color. It is known that the oxidation of said pigments causes loss of color and effectively the mixing made in the free air, as we do, can be responsible for some loss of color in the product, in comparison to the same kind of raw material processed in presses with mixers totally closed and under vacuum.

Reduction of the oxidation of the pigments is a plus for this latter type of vacuum system.

### Conditions Under Vacuum

On the other hand, when introducing the raw material in a mixer totally under vacuum, usually some air will enter with the semolina. This air could have an "exploding" effect inside the mixer so to scatter some dry raw material all over the mixer. This could generate white spots and irregularity in the consistency of the dough.

Another point to take into consideration is the introduction of the trimmings in the long goods presses:

—If by means of rotary valve the effect would be the one noted above.

—If by means of a screw, the amount of air introduced in the mixer is limited but the trimming would be partially bleached and denatured.

In our presses, we endeavor to treat the raw material with the utmost respect, trying to mix it, working it and extruding it without inducing excessive heat, friction, etc., which would cause damage to the initial quality of said raw material.

Sometimes, however, the best pasta after the extrusion is not the best pasta after cooking.

From the dies to the packaging there are several passages and treatments which have a tremendous influence on the quality of pasta.

Just to name a couple:

—The negative effect of a poorly conceived preliminary dryer

—and, on the positive side, the improved product processed in high temperature dryers.

In regard to "High Temperature Dryers," you will notice that in the BRAIBANTI folder available for the participants of this seminar, we have included a photostatic copy of an article published in the April 1974 issue of the Macaroni Journal.

April 1974 means 8 years ago . . . so today we are not saying anything new.

In fact, the first commercial long goods high temperature line was installed in 1968. Together with a distinguished guest, we saw this line working just a few weeks ago.

### Buitoni Listing

As part of a plan to "spin off" Perugina S.p.A., the confectionery subsidiary of Industrie Buitoni Perugina (IBP), IBP has announced that it will increase Perugina's capital by \$65 million and will sell to the general public about a fifth of its present 100% ownership. These actions are seen as a prelude to obtaining approval for listing of Perugina's shares on the Milan Bourse.

The capital increase is the principal step to meeting requirements of market authorities. Another requirement is that a reasonable share of the company's capital be owned by the general public.

Perugina in the past year had gross profits of L20 billion on sales of L200 billion. This represented a considerable turnaround from the candy company's poor showing in the early 1970's.



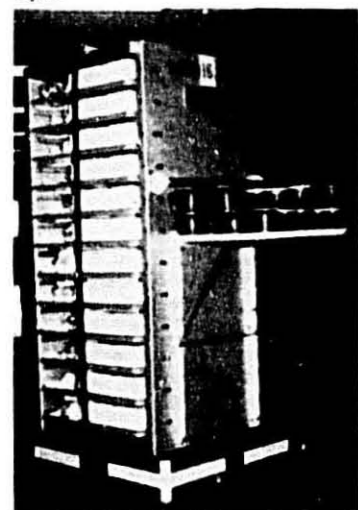
## HOSPITAL FOOD GETS BETTER

by Jerry Whitaker

People who have stayed in hospitals have both good and bad memories of their experiences, and these experiences always make for conversation when the discussion of other subjects has been exhausted. Most frequently hospital anecdotes concern complaints, and the most common complaint among patient alumni is a very basic, yet extremely critical one—food!

Existing Army hospitals are being modernized and new ones constructed using a standardized food service system based upon yesterday's technology which is very labor intensive. The US Army Natick Research and Development Laboratories, Natick, MA (NLABS), has been involved with updating the Army hospital feeding system to use less labor. The site that was chosen for this experimental program was Moncrief Army Hospital at Fort Jackson, South Carolina.

Moncrief, like many hospitals, previously employed a cook/serve preparation system. With such a system, the total time required to assemble, plate, and transport food from the kitchen to the ward is the most crucial element for attaining favorable results. Although precautions are taken to serve foods at proper temperatures, delays sometimes result in hot food being served lukewarm while cold foods may be served tepid.



Rethermalization is completed and the patient trays are ready for service.

### Cook-Freeze System

To improve this situation yet reduce labor requirements, NLABS designed and implemented for test purposes a cook/freeze food production system in which food is economically prepared in large quantities days or weeks in advance, rapid-chilled, blast frozen, packaged in ten portion units, and stored in a walk-in freezer. Food that is not frozen for quality or economical reasons is prepared a day ahead and rapid-chilled.

To prepare the menu for a particular day, specific foods are removed from the freezer approximately 24 hours before serving, and placed in a rapid thaw box. While in a chilled state, the food is brought to a conveyor belt area where trays are individually assembled according to each patient's menu selections.

### Delivery System

Once meals are placed on the trays in the kitchen and covered with insulated tops they are placed in a unique delivery cart, which is used for storage, rethermalization (attaining desired hot temperature), delivery and retrieval. A cart holds 24 chilled meals and fits inside a roll-in rethermalization/refrigeration unit which is located on each ward. Chilled storage of the meals in the rethermalization/refrigeration unit on the ward continues until shortly before meal time when a staff member will activate heating elements in order to begin a 36-minute rethermalization cycle.

The position of each food item on the tray determines whether the food is to be heated or to remain cold. Specifically, foods that require heating are placed in disposable, high-heat dish inserts, which are placed in one of three cavities in the tray's server base designated for hot food items. These dish inserts sit directly on three thermostatically-controlled heating elements, each with a different wattage, that are built into the delivery cart shelf. The elements heat the foods in the three hot food cavities by gentle conduction when the main unit has been turned on. The remaining sections of the serving tray include a cold food area, and a wing area designed to hold a beverage mug, milk carton or iced tea

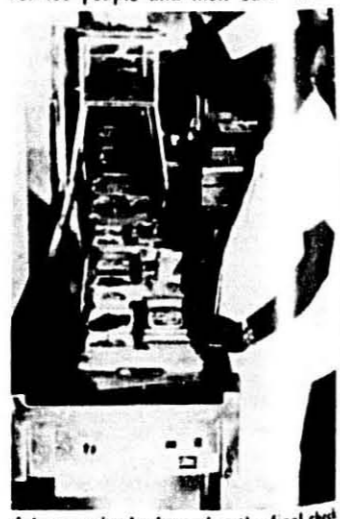
glass, flatware, and menu. Rethermalization takes place within the ward refrigerator, food that is not reheated remains cold. That is, some food items are heated while others, such as salad and milk, remain chilled. Further, the position of a tray on a shelf determines whether or not any heat is applied at all. Trays containing all-cold meals are placed on the shelves backwards so all the food will remain cold. Empty shelves remain unheated.

Because these reheating and chilling units are located on the wards, trays can be delivered to patients very soon after rethermalization. Meals are therefore, served at more desirable temperatures to the patients.

There is considerable interest in the test of this innovative food service system, because the technical features and method of operation are new both to Army and civilian hospitals. Project Officers at Natick Laboratories are in the process of collecting data and analyzing the results to determine the system's overall effectiveness.

### Pasta Pick-Up

Reynolds Aluminum containers and lids carry everything from spaghetti to lasagne to salads. And because they are aluminum, foods can be reheated or refrigerated — making it easy for food service people and their customers.



A tray service leader makes the final check for tray accuracy before delivery to the ward.

THE MACARONI JOURNAL

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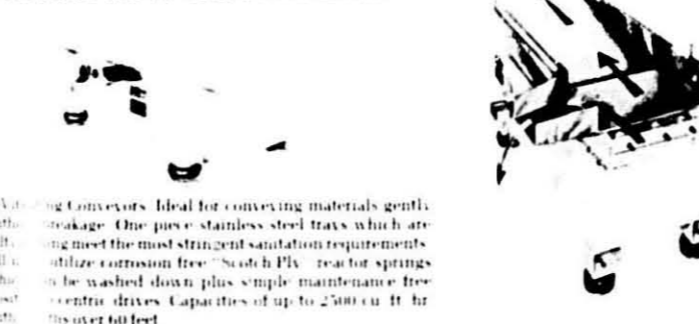


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Bulletin CVC-30

The Modu-Tran II Vibrating Conveyors transfer product subways as well as in the normal forward direction. This unique development by Aseeco Corporation makes it possible to split a stream of product to any rates of flow desired with sanitary ethically designed vibrators. Units are installed in series to distribute product to multiple packaging machines or to several use points simultaneously on demand.

Bulletin M-T10

## CONVEYING SYSTEMS SURGE STORAGE AND MODU/TRAN II DISTRIBUTION

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- 20% IMPROVEMENT IN WEIGHT TOLERANCE
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- 50% REDUCTION IN PACKAGE LOSS

### how it works

Product is delivered to a surge bin (hopper or belt type) which is the product reservoir. Upon the demand on a large station in the Modu/Tran distribution system, product is instantly delivered at the destination. During the delivery cycle, the surge bin automatically replenishes itself with product, for the next cycle.

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### Buitoni Frozen Entrees

Buitoni Foods is now shipping its entire line of 13 frozen entrees in new packaging designed to promote increased consumer interest.

The new Buitoni packaging lends itself to the creating of a Buitoni section in supermarket freezer cases, thereby encouraging increased consumer purchases. Individually, the packages now feature new, appetite appealing photographs of entree servings; collectively, the packages offer a Buitoni line "billboard" effect which will make it easier for consumers to locate the Buitoni family of authentic Italian products in the freezer cases.

New packages were developed for the following popular Buitoni products: Lasagne with Meat, Manicotti with Sauce, Baked Ziti with Sauce, Meat Ravioli Parmigiana, Baked Shells in Sauce, Eggplant Parmigiana, Cheese Ravioli Parmigiana, Stuffed Shells with Sauce, Sausage & Peppers, Shrimp Marinara, Chicken Fillets with Noodles, Family Lasagne, and Deep Dish Lasagne. Photography for the new packages was done by George Ratkai, New York City.

Buitoni Foods Corp. manufactures and markets a full line of quality Italian dry pasta products, sauces, pizzas and frozen entrees.

### Rexham Flexible Packaging

W. R. Allen, Director of Marketing for Rexham Corporation's Flexible Packaging Division has announced the appointment of E. R. "Gene" Strupinsky as Business Manager, Consumer.

Mr. Strupinsky will be responsible for all marketing functions within the Consumer business area at Flexible, headquartered in Charlotte, North Carolina.

Reporting to Mr. Strupinsky will be J. Hunter Phillips, Senior Markets Manager, Consumer.

Rexham Flexible Packaging is a precision converter for packaging and technical markets. The Division's Consumer business employs high technology converting processes to provide protective, graphically-appealing flexible materials to manufacturers of food, beverages, tobacco and other consumer-related products.



Buitoni Spinach Pasta

### Buitoni Spinach Pasta

Buitoni Foods is introducing nationally new Buitoni High Protein Spinach Pasta in four popular pasta shapes, it was announced recently by William P. Smolka, Buitoni Vice President—Marketing and Sales.

The new spinach pasta additions to Buitoni's High Protein Pasta product line—Elbows, Shells, Twists, and Ziti varieties—complement spinach linguine to provide the consumer with a choice of five popular shapes of spinach pasta.

"Buitoni decided to expand its High Protein line of pasta with these four new Buitoni High Protein Spinach Pasta products because our research indicates that today's consumers are looking for greater variety without sacrificing quality," Smolka commented.

All four new varieties of Buitoni High Protein Spinach Pasta come packaged in eight-ounce boxes.

Introductory support for the new spinach pasta products includes a "Buy Two, Get One Free" offer and a special free recipes promotion. Additional support is being provided through Buitoni's on-going programs.

### Hershey Purchases Pasta Operation in Brazil

Hershey Foods Corporation announced that it has purchased the remaining 60 percent interest of its two joint venture corporations in Brazil, Petybon and Codipra, from a Brazilian partner, S. A. Industrias Reunidas F. Matarazzo, at a cost of \$13,000,000.

Petybon and Codipra were formed as joint ventures with Matarazzo in January 1979. Petybon manufactures a full line of pasta products in a modern plant located in San Jose do Campos, which is 50 miles from Sao Paulo. This Petybon brand has a significant share of market especially in the State of Sao Paulo.

Biscuit and margarine products are manufactured in two separate facilities in Sao Paulo. The biscuit line, which recently has been relaunched in newly designed packaging, is also strong in the Sao Paulo market. The margarine business is concentrated largely in institutional products and markets. Codipra sells and distributes the Petybon product lines.

### Japan Imports Pasta

French government efforts to stimulate export sales of flour were recently cited by the Foreign Agricultural Service of the U. S. Department of Agriculture.

France has been pressuring Japan to purchase 10,000 tonnes of French flour-based products. "France has asked Japan to purchase a product that is 97% flour, but Japan would prefer a 60% flour-based product," it was indicated. "In recent years, Japanese flour imports have been very small and have come almost exclusively from its major wheat suppliers. Canada, the U.S. and Australia.

Japanese flour imports in 1980-81 totaled 266 tonnes, including 13 tonnes from the E.C., 186 from Canada and 67 from Australia, with none from the U.S.

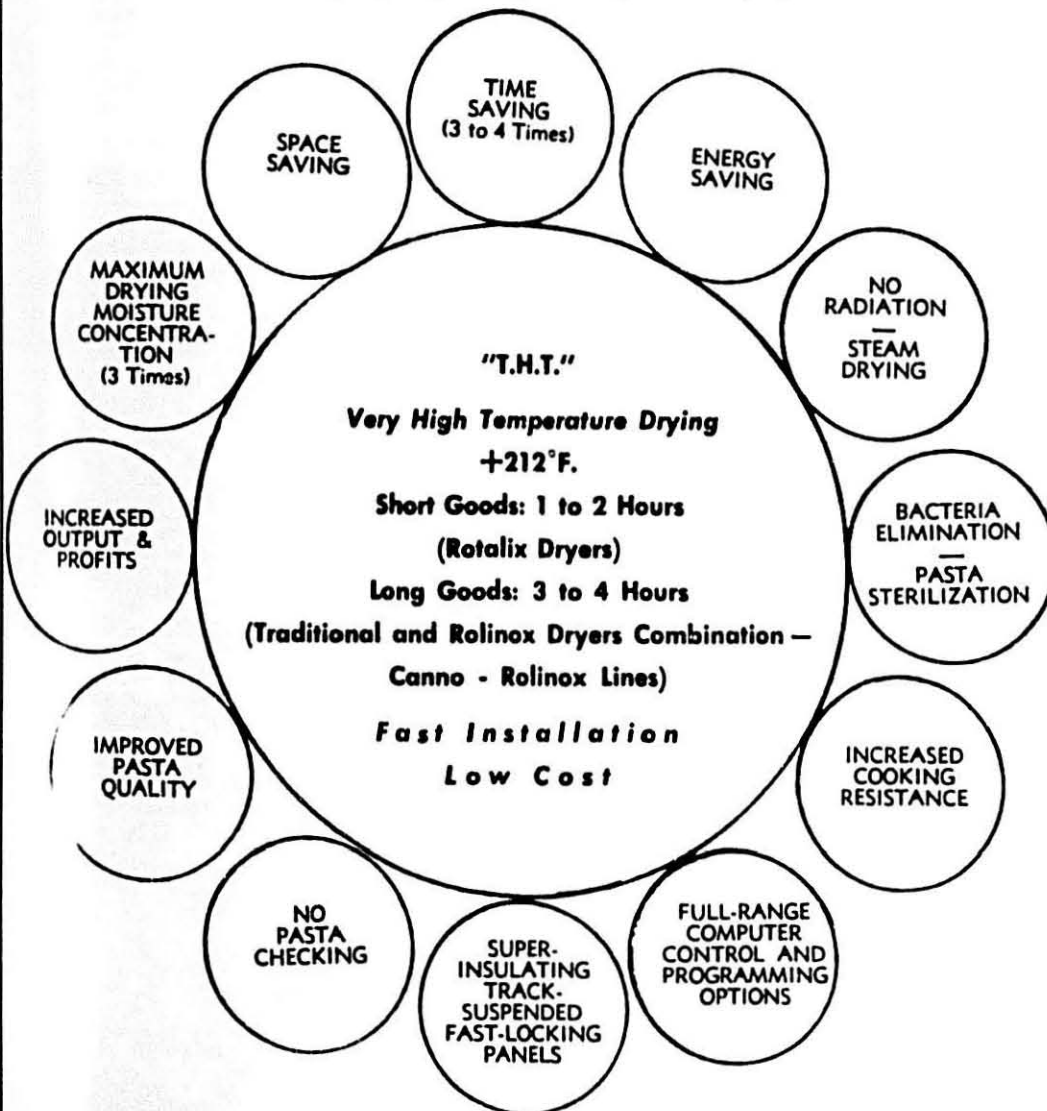
At the same time, Japan has registered a sharp increase in its imports of finished pasta products, although the total remains small. In the 1981 calendar year, pasta imports soared to 9,914 tonnes, contrasted with 1,987 in 1977. "This increase," the F.A.S. said, "is primarily due to a reduction in the pasta tariff rate and to steep rises in the resale price for durum, currently at about \$347 per tonne. Some Japanese pasta manufacturers have started to import finished products from Italy, U.S. and other sources."

Of the 1981 pasta imports into Japan, Italy accounted for 9,606 tonnes, followed by the U.S. at 171, Canada 25, Australia 11, and other suppliers 11 tonnes.

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## Egg Situation

From U.S.D.A. Economic Research Service

Reduced hatchery activity will likely lower egg output to around 1 percent below a year earlier for the rest of this year. Improving consumer demand for a smaller supply of high-protein foods is expected to help strengthen egg prices during the remainder of the year.

### Producers Reduce Laying Flocks

Egg production during the first quarter of the marketing year was the same as a year earlier, even though the number of layers was down 1 percent. Even with record cold temperatures in some areas, the rate of lay was slightly above last year.

The Crop Reporting Board has discontinued publishing monthly estimates of layers and egg production, and the latest data covers (December-February). The laying flock on December 1 (the start of the marketing year) was 1 percent below a year earlier. Although the number of hens equaled the year-earlier level on February 1, the number on hand during the quarter was down 1 percent.

### Laying Flock Maintained

The laying flock has been almost maintained at last year's level by reducing the number of hens slaughtered, because the number of replacement pullets has trailed a year earlier since February 1980. Low returns in 1980 and 1981 and high interest rates have discouraged producers from expanding. Improved returns during September 1981 - April 1982 were expected to increase the hatch of pullets intended as table-egg layers, but producers apparently are still recouping losses and are hesitant to expand. As a result, the January-April cumulative hatch was 3 percent below last year. Nevertheless, this was not as low as the 5-percent decline for the same period between 1981 and 1980.

Another measure of producer retention of old hens is the percent of the laying flock that has been force molted. On March 1, 18.6 percent of the flock had completed molting, up from 15.6 percent last year. Thus, more of the hens are being molted and kept for another laying cycle than last year.

Producers usually cull more hens after Easter, when egg prices drop sharply. This year, producers' cullings were 22 percent below last year in March. However, the additional eggs that were stored for Easter sales brought prices down before the holiday. Consequently, preliminary weekly slaughter of light-type birds was up 17 percent during the week before Easter, whereas last year, slaughter was down 13 percent prior to the holiday.

### Egg Production To Decline

Egg production during the balance of 1982 is expected to trail 1981 by around 1 percent. During 1981, producers maintained output by keeping their old hens in production longer while maintaining a high rate of lay. In 1981, producers increased culling when prices declined and reduced culling when prices strengthened. However, because the number of replacement pullets continues to decline, producers may have more problems with extending the laying cycle of old hens, even with improved returns. Producers may also not be able to maintain the high rates of lay as the flock continues to age. In addition, older hens tend to lay larger eggs with low shell quality, resulting in more cracked and checked (a hairline crack) eggs.

### Egg Prices Above 1981

Egg prices this year were above 1981 levels until April, when prices slipped below a year earlier. Prices for cartoned Grade A large eggs in New York averaged 78 cents a dozen during December 1981-February 1982, up about 2 cents from last year. Egg prices increased to 82 cents in mid-March in expectation of increased consumer demand for Easter. However, egg inventories also rose, and prices dropped to 76 cents in late March, where they remained until Easter (April 11). Prices declined to 68 cents after Easter and remained at the level through early May. Prices then fell further, averaging about 63 cents in late May. For March-May, prices for cartoned Grade A large eggs in New York averaged about 72 cents compared with last year's 70 cents.

Egg prices during June-November are expected to average above last year. Prices may be between 72 and 76 cents a dozen during June-August, up 1 to 5 cents from last year. They are ex-

pected to increase seasonally during September-November, averaging 78 to 82 cents, also up 1 to 5 cents from last year.

Price increases for other high-protein foods should help the demand for eggs. Furthermore, a larger proportion of eggs would be needed for hatching if egg producers begin increasing replacement pullets, and broiler producers expand output. The demand by commercial egg breakers may strengthen from early 1982's, but it may not be much stronger than in 1981. Thus, if total egg supplies are down 1 percent as expected, there will be more upward pressure on table egg prices in the second half of 1982.

### American Bakeries Sell Monark Egg Corporation

Richard P. Vogel, a private investor of Milwaukee, has acquired Monark Egg Corp. of Kansas City from American Bakeries Co.

Mr. Vogel, who has been named chairman of the company, said that present operating management will continue. Melvin E. Krigel is president of Monark Egg; Kenneth Scherer is secretary.

Mr. Vogel, former owner of Hunt Valve Co., Salem, Ohio, and of Murphy Diesel, West Allis, Wis., said he purchased Monark Egg as an investment.

Monark, a dried egg processor with plants in Kansas City and Hays, Kas., is the third non-baking subsidiary divested by American Bakeries in recent months.

### This Egg Woman Wears Two Hats

As the day-shift grader-in-charge at an egg plant in Norco, Calif., Betty Barnhart figuratively wears two hats.

Under the U.S. Department of Agriculture's voluntary shell egg grading program, she supervises five graders who sort eggs for quality and size at the Norco Ranch plant. And when she isn't doing that, she's making sure egg and egg products are properly handled in the plant, as required by the Mandatory Egg Products Inspection Act.

(Continued on page 42)

THE MACARONI JOURNAL

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## MILLING FOR ITALIAN PASTA

by Paolo Antolini

The value of pasta as a food is the result of a more complicated process than the simple manufacture of pasta. This process begins with the grain itself and its milling.

What is needed in Italy is an uncomplicated mill that extracts about 85 percent of the flour contained in the grain. Although these flours are particularly adapted to the making of breads, biscuits, and similar products, it is possible, by altering the milling process slightly, to obtain from soft grain wheat a product that is less floury with much rougher and larger particles.

In former times in Italy, and other countries, such soft-grain products were used extensively in the making of pasta, although they were also mixed with hard wheat meals or groats.

The grain of hard wheat in all varieties has a vitreous and hard seed coat that is considerably fissured. It cannot be crushed but must be ground in a special and complex piece of equipment that not only contains mills - a pair of steel cylinders that have angled grinding edges that rotate, cutting rather than crushing the grain - but also devices for cleaning and separating the bran and other by-products. The roller mills achieve extraction levels of 70 to 75 percent, and the product is used principally for the making of pastas.

### Consumer Misunderstanding

Consumers usually do not understand why soft grain wheats are suited to bread making while hard grain wheats are better for the manufacture of pasta. First, hard grain wheat contains less starch and more protein and fats than soft grain wheat. It also has more mineral salts and more vitamins. The most important difference, however, is a physical characteristic involving the elasticity or plasticity of the material.

Because hard grained wheat not only has more proteins, but a greater variety of them - the most important being gluten which gives the final product its consistency - pasta made with hard grain wheat stretches more slowly and does not tend to tear or break up. Because hard wheat is less elastic and yielding, it has a capacity

to absorb water without being reduced to a pulp. The glutes act as a shell or container that retains the substance of the pasta, especially the starches which tend to dissipate in water.

Hard grain meals are blond, rather than the white color of soft grain meals. The meals are less grainy, less volatile, with a glassy quality. When rubbed between the fingers, they feel like granulated sugar. They do not smudge cloth, nor do they tend to adhere to it.

### Test of Differences

A test of the differences between soft wheat flour and hard wheat flour is known as "Baccaris's Experiment." Two balls of pasta were made up, one of bread flour, the second of *semola* flour. Each of the balls was held in a hand under running water. The soluble components of the two balls will be washed away by the water. Only the insoluble components will be left. The starch, therefore, will be carried off by the water, while the gluten will be left behind. And it is that remainder, the gluten, that gives both of the wheat varieties their different properties.

Because pasta is made without leaven, its capacity to absorb water is enhanced. This in turn increases its digestibility. It retains its absorptive capacity even after it has been chewed which assists action by the gastric fluids.

In the milling of soft and hard wheats, it must be remembered that hard grain wheats have a lower yield at higher cost than soft-grained wheats. This is because the hard-grain wheats must be further purified or cleansed after the initial roller grinding and bolting. The whole process breaks down into two techniques: high rolling and low rolling.

High rolling involves placing the two rollers at a considerable distance from one another. The result is *semola* or *semolino* - meal or groats. This process yields the best material for making pasta. A higher extraction level can be achieved through low rolling with the rollers placed closer together. But the results are less satisfactory and are principally used as byproducts, particularly animal feeds. Low milling produces 25 to 30 percent bran.

Italian law sets qualitative limitation on the production of meals from hard wheat flours. These specifications set out certain percentages of salts and cellulose that manufactured pastas may contain. Also governed are nitrogenous substances and maximum acidity levels.

These specifications have tended to promote production of more highly refined meals and flours. Excluded from production are "integral" pastas which include the by-products of milling especially bran or dark pastas.

Now, however, the rigidity of the law is being questioned. Many critics argue that the way has been opened for market speculation in the area of specialized or dietetic pastas which are not so severely restricted.

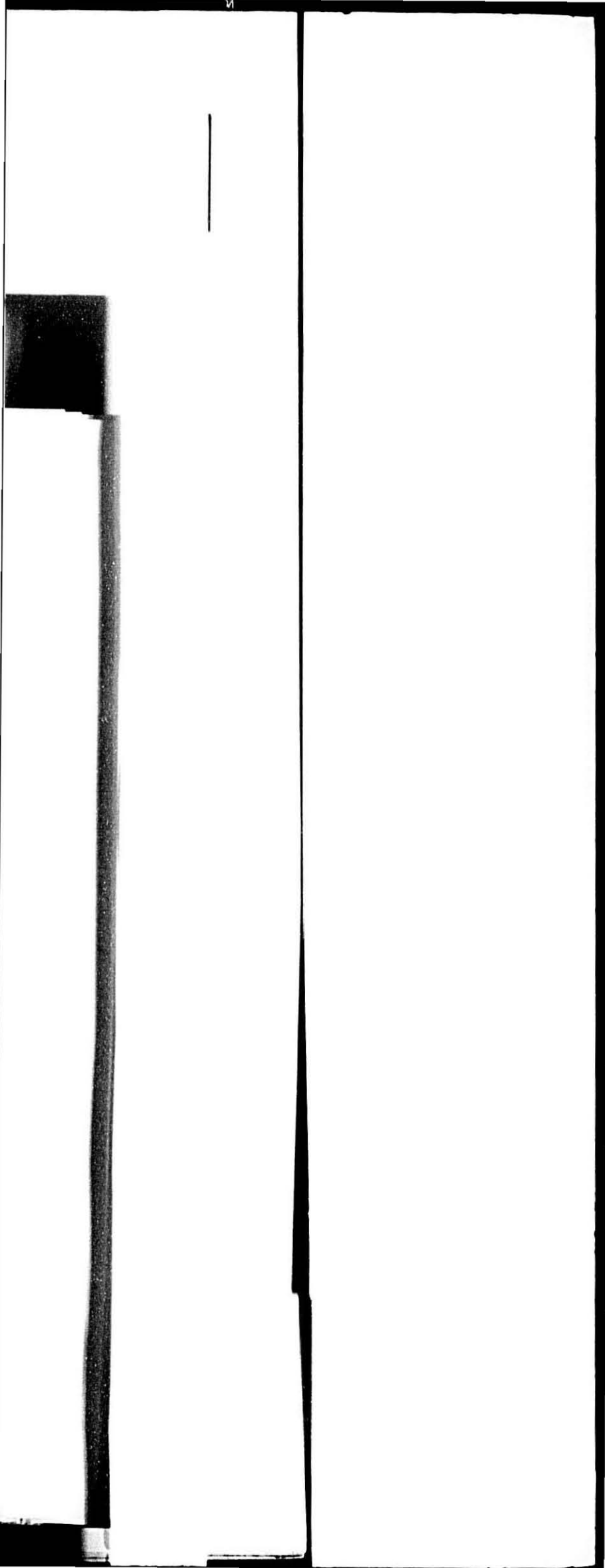
Modifications in the law, proposed last year by the National Union of Italian Pasta Makers and the Italian Association of Millers and Pasta Makers, the two largest organizations of producers, would permit variation in the proportions of contents. They also requested the admittance of a third type of pasta made with hard-grain meal but containing a much higher level of byproduct and cellulose than is currently allowed. Such a change in the law would allow fuller use of the total product and would permit marketing a pasta that is more ordinary but more interesting dietetically and nutritionally.

### Concerns About Change

The concern about changing the law is that the door will be opened to abuses. Permission to add more bran or other generally undesirable particulate matter to soft-grain flours, for example, could tempt possible speculators to match or to exceed permitted levels throughout the whole range of production. And speculators could take bran and particulate matter from inferior hard wheats presently destined for animal consumption and add them to soft-wheat products in which such materials are relatively scarce.

Author Paolo Antolini gives the following criteria to help consumers judge the quality of pasta:

(Continued on page 36)





The first standard that can be quickly established concerns the soundness of pasta. It should be free of insects (the corn beetle loves pasta and can be troublesome in shops and storerooms, particularly in autumn). Another way to judge the purity of pasta is color. If a product has been "sophisticated" with rejected particles and with a clearly noticeable percentage of soft-grain meal, the color will be darker than one of the finest manufacture. The soft grain confers on the finished pasta a gray tint while the undesirable particles endow it with a brownish hue.

The undesirable sample will taste slightly bitter or sour and quite coarse. A pasta of this type cannot be preserved for it tends to spoil quickly because of the presence of excessive fats.

No noticeable abnormality between the two pastas can be found in cooking except for a certain discoloration of water with the inferior pasta. However, the pasta will tend to overcook and become gluey and slimy.

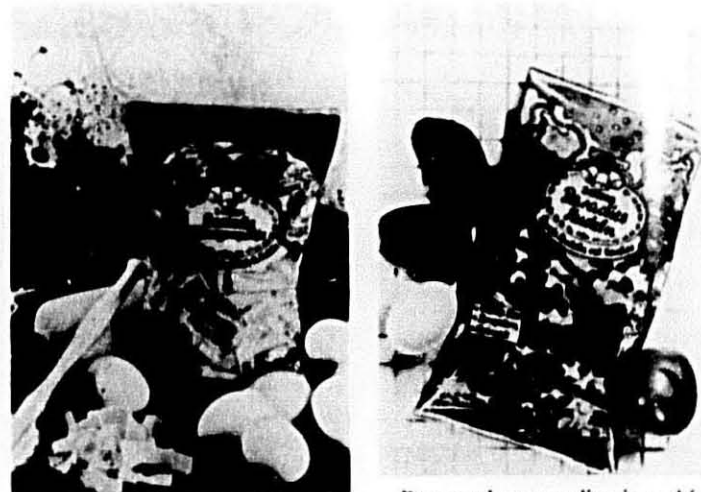
A good pasta will be bright yellow in color and transparent when held to the light without the brown or blackish tinges that inferior pasta displays. A good pasta also cooks uniformly in the center as well as on the surface.

#### Definitive Proof

The definitive proof of the quality of the pasta, Antolini says, is taste. The consumer should avoid pasta that leaves a rancid or acidic taste in the mouth. Compactness and elasticity is a good sign. Pasta should have a certain sweetness, and its odor should remind the consumer of wheat or fresh meal.

Opposed to the strictness of Italian law governing quality of pasta are the regulations of the European Economic Community which permit the addition of soft-grain wheat to hard-grain wheat to a maximum of 7 percent, a limitation far exceeding the prevailing norm in international commerce of 5 percent.

Antolini notes that it is virtually inevitable that meal made with hard-grain wheat will contain a small quantity of soft grains since soft grain often germinates spontaneously in fields sown with hard-grain varieties. Often seeds have survived from a previous planting. And, in selecting seed, it is not possible to differentiate totally and separate the two varieties. An additional mix can occur if silos to store soft-grain wheat one year are used to store hard wheats the next.

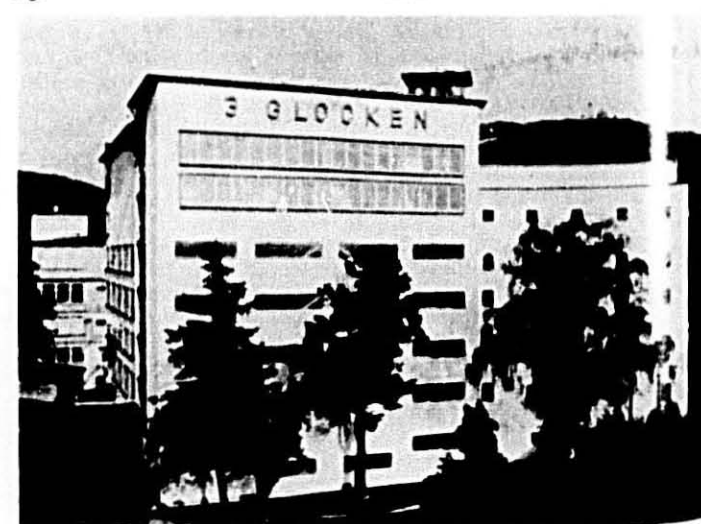


#### German Noodles

Mrs. Marianne Rihm, proprietress of the Drei Glocken, GmbH, Weinheim, West Germany, files the following report of conditions in that country.

Pasta sales are stable but the industry is changing. The Birkel Group consists of four plants which along with some seven other plants make up the major industrial producers of pasta in Germany. There are two specialty makers of "Spatzle" but the remaining small plants are of only minor importance.

Egg spaghetti and egg noodles are the most popular shapes. Sales of products with high egg content are growing.



Durum wheat semolina is used for typical German egg noodle specialties and also soft wheat fine semolina. For the purpose of warding off the Italian dumping imports, a very cheap quality with high soft wheat content is produced in some cases.

A small portion of pasta production is still packed in folding cartons, but most is packed in polypropylene or polyethylene foil.

Prices for 250 grams range from 80 Pfennig up to Deutsche Marks 2.15 according to quality and egg content.

Current problems consist of high taxes; the problem of obtaining skilled workers in the face of high unemployment; absenteeism caused by social legislation; unprecedented competition which keeps profit margins thin.

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## FAMILY BUSINESS COLUMN

by Frank M. Butrick, Akron, Ohio

### Part III—Don't Turn Your Son Away from Your Business

Since the days of the Old Testament, the world has believed that the son of the owner/manager had it made. In fiction, song, and popular fancy, the surest way to success has been to be born the son of a successful man who owns his own business. If a fellow muffs that, the next best is to marry the daughter of a successful owner/manager. But all those romantic tales of the family business cast the son (or would-be son-in-law) as the hero; and who is the villain? The owner/manager! How can a proud father, welcoming his son into his home-made business, end up as a villain? It is easy. Worse yet, it is natural.

As an active convention speaker, I put on a dozen or more workshop/seminars for sons and daughters of owner/managers every year. These draw younger people from coast to coast, who come to talk over their problems and search for solutions, reassurance, and someone who understands what they are up against. From what they tell me, it is evident that getting a son or daughter into the family business is no trick at all (most sons work summers for their fathers) — the task is avoiding the frustrations and disillusionment which turn a son against both father and his business, and involving the son early enough to give him a chance to grow into the business and before he must make his career selection.

#### Natural Desire

Nothing could be more natural than for the owner/manager of an macaroni business to welcome his son or sons into that business. A business which can be passed from one generation to the next has proven its solidity. It is the final certification that its founder built it well. But more important than that is the personal satisfaction of having a son, who could have chosen from a multitude of occupations, elect to follow in "his father's footsteps", to join him in the business, learn what his father has learned, and someday continue the business. But the father-son relationship, particularly for businessmen, is seldom as graceful as fathers pretend — or would like to have it be.

Understandably, the business owner is preoccupied with his own viewpoint (like most humans). Unfortunately, he seldom makes a deliberate effort to understand his son's viewpoint. Specifically, he fails to realize that until the average son is in his mid-twenties, he does not make career decisions in a maturely adult manner — he reacts. And most of all, he reacts to his parents — particularly to his own father — and to his homelife. So to understand the son, the father must look first at himself — as he appears to his son, and how his son sees the father and the business. This objectivity is not easy to accomplish.

#### Business Comes First

The entrepreneur is a man obsessed with his business; it comes first, absorbing most of his time. This usually means nights and weekends as well as days — and thinking about work when the owner is home. Inevitably, the owner/manager's family suffers. His wife gets used to seeing her husband during fleeting hours, when he is too exhausted and preoccupied to be much of a husband anyway; but his children fare less well — a chance to play with daddy becomes a major event.

During those very years when a typical entrepreneur is putting his maximum into his business, his children are becoming old enough to realize that the father next door is home at 5:30 and all weekend long, and has lots of time for his kids. By the time the businessman's children are in their teen years, they are accustomed to doing largely without their father; he is not a stranger but he represents the business and work — and all too often makes them seem grim and forbidding and all-consuming. Boys look at their father, equate his long hours of work — his inability to relax and play, his complaining about employees and customers and taxes — and the business, and they want no part of it.

Seldom is the wife involved in the business so the youngster grows up in a healthy blend of business and home life. What he hears instead are family arguments about the business — father works too long hours, the mother

spends too much money, etc. — infinitum. And worse yet, seldom is the son invited into the business when every boy wants to be his father's helper — at age 12 to 14. Of course, a 12-year old is a nuisance in a business; the employee in charge of keeping him out of trouble (father is too busy) gets little work done. And, of course, it is a nuisance to answer the questions (and suffer the suggestions) of a child as he gets acquainted with the business. Too few fathers try. Too many who try give up. So the average business owner's son is not invited into the business until he is "old enough to understand", or "appreciate it", or be "useful."

By that time it take a deliberate selling job to lure sons into the business at all. Fortunately this inevitably starts with summer work, which the youngster can accept philosophically — it will only last three months. But he is usually given menial work. He doesn't meet the business at all; merely labors for wages. September and school come as a relief from the tedium and boredom. For the same reason, college is tremendously popular among the sons of owner/managers. The son favors most anything which will get him away from his parents and the business, and postpone his having to make a decision about his career. On the father's side, he also wants his son in college, out of his hair and the entire problem shelved. He wants his son to "grow up and become a man" — but he doesn't have time to guide his son through the process, so he abdicates the task to a collection of unknown professors who are presumed to be experts. Of course, at college the son does become an adult, and he begins to see his father and the business differently. But not much.

#### Educational Goals

Extensive research by colleges and various institutions has failed to turn up any correlation between educational accomplishment and entrepreneurial success; the majority of entrepreneurs are not college graduates at all. Nonetheless, most of them want their son to be "better educated"; the

(Continued on page 40)

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## Family Business

(Continued from page 38)

overwhelming majority of owner/manager's sons are thus sent to college. But colleges do not teach jobs, nor types of business; and certainly not the food manufacturing business; they teach business as a generality — and the professions. The son learns little specifically about his father's business, so it is not surprising that he returns (if not lured into a profession) with his teenage prejudices intact.

Those sons who do return to join the business have a multitude of reasons for doing so — yet seldom (if ever) voiced and usually completely misinterpreted by the father. Some sons join because their father has sold them on the benefits of independence and individual initiative (unfortunate, since they will find little of either working under their father). Others join because they are convinced they can make more money than as employees for some other company. A few because they genuinely like their father and want to work with him, and some few because they grew up in the business and never thought of doing anything else. And some because they are lazy and cannot hold a job, or stupid and cannot get a job, or just because it is the course of least resistance. But the family business has been so interwoven with their father's life — and the son's reaction to his recollection of adolescence is so strong — that joining or not joining the business is instinctive or reactive, rather than a rational, carefully considered career decision.

### Teach Them Young

Fathers who want their sons to join them are asking for disappointment if they wait until their sons are "grown up" before teaching them the family business — not the menial unloading-trucks end, but the fun of decision making, the satisfaction of jobs well done and customers satisfied. The challenge of prospect and customer service and business management and long-term planning. Of a man paddling his private canoe.

If you would have your son become part of your business, start early—very early — to involve him in your life. Discuss your dreams and plans with him, tell him of your problems and of the decisions you make; ask him to watch you at the fine art of president-

ing. When you talk about your day over evening highballs or the dinner table, remember that a half-empty pail is also half full; always present the positive side. We businessmen exaggerate our problems too much at home — and our children are listening and forming opinions which can haunt us. No business is a bed of roses; but nor is one all thorns.

Let your son see how much you enjoy your macaroni business. He knows that you work long hours — but did you ever tell him that it is because you enjoy it, that it is more fun than going fishing or bowling or playing with a stamp collection? Does he understand that you could always throw in the sponge and become somebody's employee — but that the personal challenge and satisfaction of your own business make such a course unthinkable?

### Let Enthusiasm Show

Your owner/managers do a lousy public relations job with your own sons; the ones who get away are turned off by their father! So let your son see the joys, the satisfactions, and pleasures you derive from being master over your own destiny. Then he will want to join you, to emulate your accomplishments, and to help you create bigger and better new ones. And when he wants in, hold the door wide open. Do not forget — you set the stage for your son's decision; the responsibility for disappointments or satisfactions with your son is primarily your own.

This article is condensed from a chapter in the author's book, **THE FAMILY BUSINESS**, to be released by the IBI Press, Box 159, Akron, OH 44309.

MACARONI JOURNAL will be printing key chapters from the book, the first ever devoted exclusively to the personal relationships within the privately-owned business, during the forthcoming months. For information on the book, contact the publisher directly.

Frank Butrick has, for over two decades, been a leading consultant, convention speaker and author on the family-owned business. He has written hundreds of magazine articles through the years and his concepts have been incorporated in numerous books. He averages nearly 50 convention appearances a year, and is active as a consultant, serving business owners all over America. If you have a situation

upon which you would like Mr. Butrick's comments or advice, you may contact him through MACARONI JOURNAL, or by writing the IBI Press in Akron, or calling him at 216-253-1757. There is no cost or obligation — but if you write, be patient. His heavy travel schedule precludes quick replies to his correspondence.

### Bridal Shower

A. C. Nielsen Company's Nielsen Clearing House Group has announced that Bridal Shower,® a program for directing free product samples to newly-forming households, became fully operational on June 1st and is currently distributing samples in four major metropolitan areas. This system of distributing samples has enjoyed long-term success in Canada, where it has proven its ability to put products in the hands of young husbands and wives at a time when many of their brand preferences and loyalties are being established. Now the concept is operational in the U.S. where over 2.4 million marriages occurred last year.

Participating newspapers in San Antonio, Houston, Louisville and Birmingham are currently presenting Bridal Shower to a total circulation that exceeds 1.2 million.

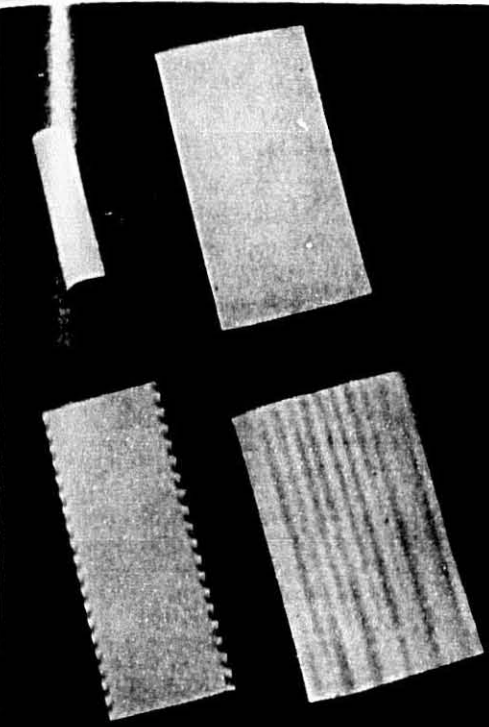
### Presented After Honeymoon

Each pack is presented to the bride and groom when they return from their honeymoon and begin housekeeping — the ideal time to gain new trials on a grocery, household, or personal product item. The packages, which have a retail value in excess of \$25, are presented to the couple completely free of obligation and contain products from such nationally prominent manufacturers as Lever Brothers, I. Warner-Lambert, Miles Laboratories, Hormel and Golden Grain.

The program operates in cooperation with some of the largest retail stores and newspapers in the country, each of which receives exclusive distribution rights in its market area.

Some product categories remain available in the program. The products that can be included in the boxes are limited only by product-class exclusivity and space availability. For further information regarding participation, contact Terry Spencer, Nielsen Clearing House, 1900 North 3rd Street, Clinton, Iowa 52732. 319-242-4505

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### Egg Woman

(Continued from page 32)

"About one-third of the egg products plants are known as combination plants because they have both shell egg grading and egg products inspections," Barnhart said. "Employees like me handle both areas of responsibility in these plants because it increases the efficiency of both programs."

Barnhart has been associated with the poultry industry nearly 20 years, and said she wholeheartedly supports the grading and inspection programs.

"As federal-state graders, we provide a service to the plant while also certifying that the product has been properly graded, processed and packaged in a sanitary plant," she said. "This makes buying high-quality eggs easier for consumers."

Thus, when Barnhart talks about what USDA does to make sure only wholesome egg and egg products reach the marketplace, and that USDA-grade labeled eggs meet official quality standards, she speaks with authority. Barnhart said USDA's grading program is entirely voluntary and paid for on a fee-for-service basis. It is authorized under the Agricultural Marketing Act of 1946.

"Norco processes approximately 160,000 cases of eggs per month, making it one of the nation's busiest

plants," she said. "However, the grading and inspection programs guarantee that all products leaving here have been properly processed and inspected."

Some of Barnhart's other grading duties include test weighing products, observing the packing and marking of products and helping on quality control work.

### Inspection & Grading

The egg products inspection program is different from the grading program because it requires that all liquid, frozen and dried egg products be inspected by USDA's Agricultural Marketing Service. She said that unlike the grading program, the inspection service is paid for by the government.

"USDA furnishes continuous inspection to all egg breaking and drying plants," she said. "Under the act, our concern is making sure that egg products are wholesome, unadulterated, processed under sanitary conditions and properly packaged and labeled."

Barnhart said she likes her work. "It's a lot of work but I enjoy the opportunity to provide a vital service, and that's important to me."

### Pasta: By Whatever Name, We Love It!

Marilynn Marter writes in the Philadelphia Inquirer that Americans are developing a passion for pasta.

After reviewing some history, she notes that fresh pasta shops are opening in New York and in the South Philadelphia's Ninth Street Market District. Popular egg pasta is selling at \$1.95 a pound. Spinach, tomato, and whole wheat noodles go for \$2.35 a pound.

Bloomingdale's in King of Prussia has been selling fresh pasta from its Gourmet Deli department since the store opened in August. In that time, says deli manager Max Voron, demand has quadrupled for cut-to-order egg and spinach noodles at \$2.75 a pound.

A home cook whose friends nudged her into the business, Ester Gerhard opened Primarily Pasta in October, making about 20 pounds of dough daily. Now there are Saturdays when we do 120 pounds, she says. "It depends on the weather mostly, but if a food magazine has featured pasta, that can cause a demand too."

Mrs. Gerhard says: "I was thinking of making raviolis, but people keep asking for tortellini. That is where the real demand is."

And as the use of pasta clubs, so too, do the sales of sauces to go with it.

### Good Pack Expo Attendance Expected

The effects of accelerated cost recovery and increased investment tax credits, combined with growing confidence that inflation is under control and that economic growth is just around the corner, will lead to unprecedented attendance at Pack Expo '82 this November 15-19 in Chicago, according to Arthur R. Schaefer, Show Committee Chairman for the Packaging Machinery Manufacturers Institute.

"The tax motivation for capital expenditures is already there, and by November there will be more corporate confidence that the economy is stabilized, that people will be buying and that we need to be able to produce more, more efficiently."

Schaefer bases this optimism in part on the fact that the 1981 rate of inflation dropped 25% from that of 1980 and is still declining. He also cites Department of Commerce projections that economic growth will be up to three to five percent in the second half of 1982 after a second quarter low.

### Some "Wait & See"

Acknowledging that some managers charged with packaging purchasing decisions are taking a "wait-and-see" posture with respect to 1982 plans, Schaefer cites a position held by the Secretary of Commerce. Malcolm Baldrige has been repeated quoted as saying that business need beyond the short run and steady to invest until they've "wrung the last dollar of profit" out of old investments. I think more managers are coming around to that line of thinking.

"Pack Expo '82 will be the best opportunity since 1980 to compare and contrast packaging technology," he points out. "Packaging managers will have the go ahead to spend money to innovate and improve productivity. We'll have 650 exhibitors there with their technical staffs, and we'll be ready."

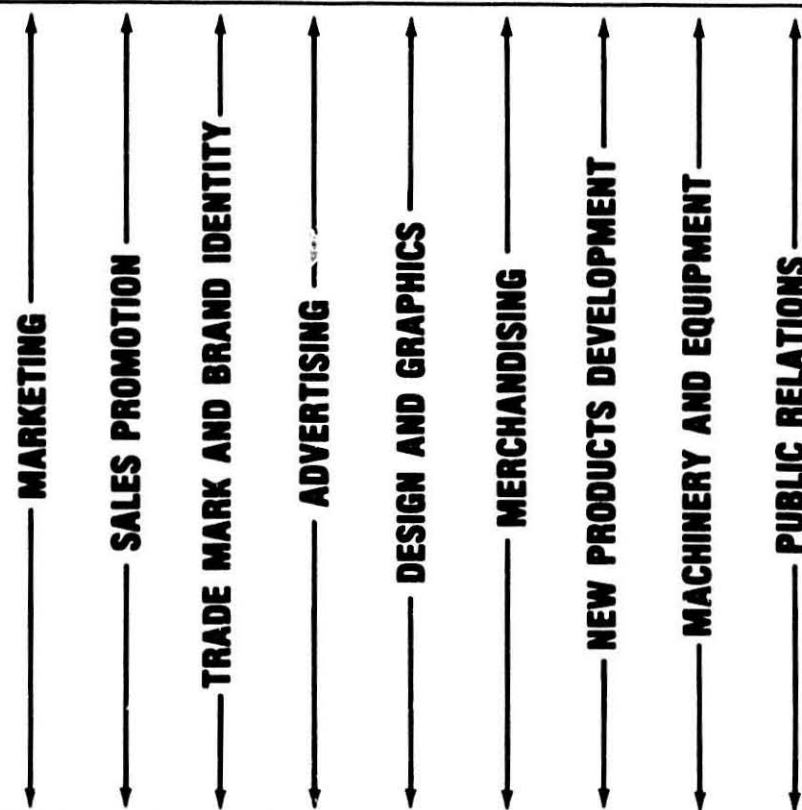
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