CAREER OPPORTUNITIES IN THE FOOD INDUSTRY

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Looking from here into the tomorrow of food manufacturing and processing, I see nothing more important to continued progress than the problem of technical careers in the industry.

I say "problem" advisedly, because that's what the industry is up against.

We are undergoing a revolution. Our field is developing into a "big-time" technical industry. Rising costs and competition are forcing food factories to develop and adopt highly efficient production, packaging, and distribution methods. Yes, even sanitation is becoming mechanized.

There are other basic trends, too. The industry has moved into a new era of consumer demand and sales opportunities. We are in the age of convenience foods. Both the homemaker and the institutional food buyer want foods as nearly ready to put onto the table as possible. They want a built-in servant in every package. They have the money to pay for it. They are willing to spend for such a worthy purpose.

Then we have a market that insists more and more on quality foods, processed and packaged in a sanitary manner—from clean, wholesome materials and ingredients. The days of sloppy food plants and careless selection and handling of materials definitely are numbered.

We are in a ruggedly competitive business where steady development of new and improved products is essential to long-range success. And new and better items come largely from technical research, just as do most improvements in processing.

On top of all these things, the industry faces some stiff technical challenges. Outstanding is the interest in preservation of foods by ionizing radiation from electronic or nuclear sources. This might develop into something of revolutionary proportions—if technical men in the field are smart enough to work out the deep-seated problems involved.

But forget for now this dream of cold sterilization and pasteurization. Let us visualize the food plant of the future without it. This plant of tomorrow will be radically different from the average one of today.

Stretching parallel across a great expanse of open floor area—between receiving and shipping platforms—will be continuous, automatic process, materials handling and packaging lines.

Bulk ingredients will be automatically proportioned into the lines where required in the formulation of the product. These will be continuously mixed with other ingredients, then continuously processed. With no change of pace, the finished product will feed into packaging lines operating at speeds far faster than today's, and without the expensive labor force required now.

Packaging materials will feed from bulk rolls into machines that form containers at a rate synchronized with processing. Filling, sealing, closing, labeling, and casing will be automatic.

With few exceptions, processing and packaging lines will have no workers stationed along them. And transfers between operations will be automatic.

Directing the operations of this fast efficient factory will be a high-caliber production expert.
will be stationed in a glass-paneled control room above the production lines and overlooking the entire production area.

Before this expert, in his glass tower, will be a battery of instruments, signal lights, and alarms on graphic panel boards. Every key process factor will be indicated, recorded, and controlled by the instruments. Any deviation from proper operation will be revealed immediately by the automatic signals.

Television screens, too, will be mounted in front of the process director. Those will be wired to cameras at points in the process that require visual observation. They will enable the director to watch for such emergencies as jam-ups in automatic feeds and off-color product discharging from the process line.

Two-way radio will be installed in the control tower, too. This will enable the process director to call maintenance crews and direct their work, order lift-truck operators to points where needed, and direct replenishment of dwindling supplies. In a big canning operation, he will direct harvesting and hauling operations to keep his plant humming at maximum capacity, while avoiding pileups at the receiving docks.

If all this sounds far-fetched, remember that everything mentioned is in operation somewhere on a piecemeal basis. And one must never lose sight of the strong incentive to automatize provided by steadily rising labor costs—plus threat of the guaranteed annual wage. Nor should one forget that machines and gadgets considered fancy and impracticable ten years ago can be built in this electronic age.

We very definitely have entered the era of automation in American industry—including food manufacturing and processing.

Let’s take a “for instance.” Now in successful commercial operation is an automatic sequence-controlled process for high-temperature, short-time sterilization and aseptic canning of a chocolate milk drink. This demonstrates what can be done in the way of integrated, interlocked, foolproof control techniques, adaptable to automation of complex processing and packaging operations.

As sanitarians, you will appreciate the fact that this system automatically sterilizes the process and filling lines, then switches to process. And if at any time any part of the processing or packaging operations fails to maintain sterile conditions, the flow of product is automatically bypassed back to the supply tank until the condition is cleared.

You can see why I say that our industry has become “big-time” in a technical sense.

Sanitarians will have a big hand in shaping up the food plant of tomorrow. It will be a factory that can be kept clean with little effort and minimum expense. In fact, it will have built-in pushbutton cleaning of process lines and equipment. And the building itself will be easily and quickly sanitized with power and pressure devices.

If we accept even a reasonable facsimile of this plant-of-tomorrow concept, then we can see that technical personnel will be required in plentiful numbers to develop and operate it.

And to those requirements we must add the number of men needed in research to improve product quality and to develop new convenience foods and packages. Here it is interesting to note the results of a survey recently conducted by General Foods Corp., among executives accounting for half of all employment in the grocery manufacturing field.

Of these executives, 85 percent foresee a large or moderate increase in research and development expenditures in the industry.

What’s more, revolutionary new developments are expected by 40 percent in the area of new products in their own companies; by 33 percent in manufacturing and processing methods; and by 33 percent in packaging materials and methods. Moderate changes are anticipated by 50, 60, and 47 percent, respectively.

Product development, particularly of convenience foods, will be one of the prime targets of research. Sixty-three percent of the executives responding to the General Foods survey see this as the area that will receive the most attention in the next ten years.

And as you all know, once a new product is developed, the technical gap between the formula and efficient manufacturing, processing, and packaging methods has to be bridged. Only technically trained food men can build that bridge.

Now here’s another significant straw in the wind, also from General Foods. This pace-setting company spent $5.8 million for research in its 1955 fiscal year. Which is a little more than 0.7 percent of its sales dollars—an increase of about 0.2 percent over earlier research budgets. Looking at this another way, the research expenditure amounted to more than 18 percent of earnings after taxes. Some 375 technical and professional specialists are employed in the labs of General Foods.

As a result of such research activity, the company sold $237.5 million of new products in the past year. New items accounted for nearly 29 percent of the firm’s total sales.

With pace-setters in the industry stepping up re-
search and making it pay dividends, others will move in the same direction.

This trend is going to require a lot of technical personnel.

Now let us get at the technical manpower question another way. There are 10,000 food factories (of a total of 36,000) with 20 to 99 employees. Each of these needs at least one technical man. Another 3,000 factories have 100 or more employees. On the average each of these can use a couple of technical people. Then at least 1,000 companies producing equipment and technical materials and supplies for the industry ought to have no less than one technical food man.

This adds up to 17,000. Estimates point to some 7,000 technically trained men in the field today. So there is room for another 10,000.

We don't believe this to be an exaggeration. One of our surveys revealed that 70 percent of the men directing the operations of food plants find food engineering involved in their work. Since most aren't technically trained, they need technical men on the payroll.

There are, without any doubt, career opportunities in the industry for a lot of additional technical people.

But you and I and others in our field must understand the factors that make a career in food rewarding to the individual. And we must pass the word along to young people who are about to select a career and train themselves for it. It is not enough to point up the demand for numbers.

Scientists, technologists, and engineers are badly needed in practically every type of industry. So we in the food field have to offer something that is particularly attractive to get our share.

I have developed a Career Check-List for sizing up our industry's advantages. Perhaps you are curious as to what is included. Here are the points:

**Your Career Check-List**

**For Quick Appraisal of Food Industry's Advantages**

Big Demand for Technical People
Good Starting Pay
Conditions Favorable to Progress
Limited Technical Competition
High Degree of Job Stability
Work in Non-Seasonal Industry
Interesting Technical Work
More Than 30,000 Companies in Field
Industry Top Spender for Improvements
Great Engineering Advances Under Way
Revolutionary Techniques Imminent

Most Major Industry Advances Still Ahead
Challenging Problems on Which to Work
Chance to Get in on "Ground Floor"
Industry Serves 165,000,000 People
Products Vital to Consumers
Industry More Depression-Proof Than Others
Can Help Improve Public Health
Work Contributes to National Wealth
Opportunity to Work in Preferred Area
Pleasant Working Environment
Chance to Pioneer Great Developments
Way Open to Top-Management Jobs
Can Start Your Own Business
Opportunity to Become a Consultant
Profession Carries High Prestige
Variety of Professional Activities
Training Suited to Allied Industries
Opportunity to Meet Many People on Job
Chance to Pick Preferred Type of Work:

- Process Development
- Equipment Design and Fabrication
- Plant Design and Construction
- Engineering Research
- Scientific Research
- Technical Sales and Service
- Purchasing Equipment and Supplies
- Teaching Your Profession
- Supervision and Management
- Product Quality Control
- Statistical Quality Control
- Sanitation and Pest Control
- Waste Disposal
- Product Development and Testing
- Packaging Engineering
- Instrumentation of Process
- Materials Handling Engineering
- Heat Transfer
- Refrigeration and Air Conditioning
- Biological Processing
- Chemical Processing
- Horticulture and Agronomy
- Nutrition
- Maintenance
- Industrial Engineering
- Accident Prevention
- Employee Relations
- Public Relations

A few of these points merit discussion. To get the latest on starting pay, I surveyed schools with courses in food technology and engineering. Graduates with a BS degree are going to work for $350 a month. A Masters brings $395. And a PhD is worth $505. These are averages. The ranges are $300 to $375 for a BS, $350 to $450 for a Masters, and $450 to $500 for a PhD.

The head of the food technology department in one school added this pointed comment to his data:
"Some of my graduates have gotten higher salaries to start than I get now."

If willingness to make a financial sacrifice is a measure of professional greatness, our teachers truly are outstanding.

Another particularly important item on the career check-list is the point: "conditions favorable to progress." This refers not only to the supply and demand situation, but to the accelerating rate of technical progress and to the acute need for high caliber technical men in management as well as technical positions.

Because our industry is in an era of technical upsurge, it is almost a new industry for the technically trained man. In a sense, he starts "on the ground floor." Then he can ride upward in his career on a tidal wave of technology and engineering.

Furthermore, food manufacturing is growing rapidly in business volume. Between 1929 and 1950, food manufacturers' sales increased 234 percent. And since 1950 the rising curve has steadily bent more quickly upward. Population is increasing more rapidly—in fact the stork made a record 4 million trips last year.

Also, manufactured and processed foods are slicing a steadily bigger share of total food business.

We predict that the industry will double its business to reach annual sales exceeding $100 billion in the next 25 years.

By comparison with the food industry, steel, automobile, and other greats are "lesser operations."

The career check-list mentions the industry as a top spender for improvements. In recent years, from $750 million to $1 billion has been spent annually for new plant and equipment. In most years, food has been second only to the great chemical processing industry in capital expenditures. Just to intelligently direct the spending of this kind of money calls for a lot of technical manpower. And certainly there is an advantage in making a technical career in a field that spends so much for improvement.

One point on the career check-list calls for an explanation. I refer to the advantage of working in a non-seasonal industry. This is an important point to get across to youngsters. When they think of food processing, many people think of the local cannery—a little seasonal operation. But the larger cannery have broadened their product lines enough to keep them going pretty much the year around.

Other food plants—such as those producing bottled milk, beverages, beer, and meat—often have seasonal peaks in their operations. But they operate at a high level year in and year out. Factories producing such products as floor, bread, and cereals operate steadily throughout the year because demand is constant and raw materials are stockpiled.

But whether or not there are peaks and valleys in plant operations, the technical man in the food industry is busy the year around. In fact most of his production-line improvements are developed and put into effect at off-peak times, for obvious reasons.

The country-canning-plant and mamma-and-popabakery concept that so many have of the food industry is a serious deterrent when it comes to inducing young people to study for technical careers in our field. And it's going to take a lot of education of high school students and teachers to attract the technical manpower that is badly needed now, will be urgently necessary in the future.

The need to take action is made particularly acute by today's industrial competition for technical talent. Never has the bidding been so strong, and at a time when young people are shying away from difficult studies like science and mathematics. Then there is a critical and worsening shortage of science teachers in high schools.

Pick up a copy of the Sunday New York Times and you find four or five pages of display advertisements for engineers. And many of these ads promise practically everything but the business to engineers who will take the jobs offered. That's tough competition for technical talent. And it influences young people who are choosing their careers.

Look over the literature issued to "sell" young people on certain types of careers. You see attractive booklets from organizations like the Engineers' Council for Professional Development. These explain and extoll the career opportunities for mechanical, civil, electrical, electronic, and chemical engineers. And not a word about the food industry, except maybe a line pointing to it as a place where chemical engineers can find jobs. Food technology and food engineering are not mentioned.

Then you see equally attractive and persuasive booklets from engineering and agricultural colleges and universities. The engineering booklets are much like that of the Engineers' Council. The agricultural booklets paint a pretty picture of the opportunities in farming and the agricultural and allied industries. But they don't say anything about careers in food processing science, technology, or engineering.

The Association of Land-Grant Colleges and Universities has just issued a well-illustrated, king-size booklet under the title, "There's a Career Ahead for You in Agriculture." In a section devoted to agricultural industry, food and fiber processing is mentioned as a field for agricultural engineers. And this section makes a couple of interesting statements:
1. "In the enterprises that serve the poultry industry, there are 20 jobs for every qualified applicant. The industry says that it can use from 2,500 to 3,500 graduates in the next five years."

2. "With rapid expansion, the soybean industry estimates it will need at least 1,000 more agricultural graduates in 5 years."

A table in the booklet carries this enticing title, "Each Year—15,000 New Jobs in These 8 Fields." One of the 8 fields is agricultural industry, and its quota is 3,000 new jobs annually. A dozen different branches of agricultural industry are listed. Among them are food processing, grain and seed processing, meat and poultry packing, dairy processing, and fats and oils. We would combine all of these under food processing. But to the Association of Land-Grant Colleges and Universities, dairy processing, for example, is not food processing.

Perhaps we should be grateful for the little attention that our industry gets in this booklet. Certainly it is more promotion than the food processing industry has done for itself.

Which brings us to some suggestions as to what we ought to do to get more people interested in technical careers in food manufacturing and processing.

Here I pass on to you comments which I recently obtained from the heads of several food technology and engineering schools:

1. "Carry out programs at the local level; in other words, programs of secondary school recruitment and programs aimed at keeping the college men interested in the field. And offer opportunities for advancement after graduation."

2. "Organize a national cooperative advertising campaign to mention the need for engineers and food technologists in all food company national advertising. Have any funds donated to universities earmarked for underwriting the expenses of their food engineering or food technology departments."

3. "Be more aggressive in inducing promising high school seniors to enter the scientific fields, publicize the opportunities in the food sciences, and encourage promising young employees to enter this field."

This particular educator adds an interesting indictment of the industry to his suggestions: "I mention the last point (encouraging young employees to enter the field) because I have encountered several young men employed in the food industry who plan to enter a university this fall. None intends to enroll in a field which even touches upon food processing, or the more fundamental fields related to the food industry."

4. "Contact high schools and acquaint them with the opportunities of the food industry. We are doing this, and our classes have tripled and quadrupled for succeeding years."

5. "Publicize food technology as a profession with opportunities. And establish and support scholarships and fellowships, both undergraduate and graduate."

6. "This one tosses the ball to me: "Keep writing about opportunities for young food technologists. Publish an article now and then which can be reprinted for greater distribution by universities to high schools."

We have published one such article, and 22,500 reprints have been distributed. Perhaps it is time for us to print another. But if we do, I hope that not only schools, but people in the industry, will do something with it—or at least with the information and ideas presented.

Just think what an impact could be made if one or more food companies in every town across the country would do a career promotion job in its local high school.

An inspired speaker can make a strong and lasting impression on high school students.

7. "Publicize the enormous opportunities available for technically and scientifically trained people in the food industry. And provide scholarships for students majoring in food technology or in biochemistry, microbiology, and chemical engineering."

8. "Grant scholarships. Establish 'chairs' of Food Technology so that teachers of food technology will be paid enough to hold them."

9. "This one really tears into the problem:

"There has been a dormant situation as regards undergraduate enrollment in food technology for the past several years, for a variety of reasons. Among the contributing factors is the apparent reluctance of the food industry to help establish and support the necessary educational facilities and to encourage the essential basic curricula to the end that graduates might assume a recognized professional status upon their college education. There has been a tendency in state institutions to incorporate food technology curricula into departments of science education in fields somewhat remote from food processing, to say the least."

The author of these last remarks also points to indifference on the part of technical people in our industry when it comes to encouraging their own children and others to go into food technology or engineering.

And he suggests the establishment of some agency similar to the Engineer's Council for Professional Development to promote technical food education..."
and to set up a system of accrediting courses.

Further ideas for promoting our industry as a place to make a rewarding technical career are found in activities carried out, or planned, by a few companies and associations.

The American Dairy Science Association, President Gould tells us, recognizes that it has a leading role to play in regard to the training of future leaders for the industry, and also in respect to the shortage of trained personnel. The Association has made some moves in this direction:

1. It has gone on record as recognizing the need for an effective film, or films, promoting the dairy branch of the industry, and calling attention to the career opportunities which the industry offers. Such films would be shown before high school students and counselors, the counselors of other agricultural groups, and before lay groups in general.

2. The Association also is considering the development of a new section which will be concerned with dairy education. It is thought that each annual meeting of the association should have at least one session dealing with teaching techniques, procedures for recruitment, etc.

The Institute of Food Technologists has a committee on education. And one of its problems is to determine what type of curriculum is best suited to training technical people for the industry. There is a wide difference of opinion, not only among members of the committee, but among people in the industry. Some say the industry needs pure scientists, others think technologists are the answers, and still others, including me, believe that more food engineers ought to be taught.

An example of what a single company can do to encourage young people to prepare for technical careers in the industry is an affair conducted a year or so ago by Continental Can Co. This firm held a conference to which technical teachers in the greater Chicago area were invited. At this meeting, speakers explained the need and opportunities for technical talent to the teachers, so that they might pass the information along to their students.

Also out in Chicago, technical people in our industry have been highly successful in getting the food career story on TV. This is something to think about. They tell me that, with the right approach, it is fairly easy to get free time on some local TV programs. The right approach seems to be to offer interesting information and speakers, on trends and developments in the industry, as well as on career opportunities.

I am informed by Col. Charles S. Lawrence, executive secretary of the Institute of Food Technologists, that approximately 300 food technologists and engineers were graduated this year. Of these, 76 hold a Masters degree, and 59 have a PhD.

This is indeed a pitifully inadequate number for our great industry.

From the colleges and universities, I have learned that an average of five jobs were available for every graduate with a BS, six for each man with a Masters, and three for the PhD.

One MS graduate being released from the Armed Forces was interviewed for 26 positions.

Now this situation will get worse before it gets better. Educators report that fewer young people are interested in technical training. There is a decreasing number of math and science teachers in high schools. And other industries are doing much more to attract young technical talent than is our industry.

Unless people like you take a serious interest in the problem and do something about it, the food industry is going to be seriously handicapped in the not distant future.

A survey recently by National Science Foundation found food firms suffering already from lack of adequate technical personnel.

We've got to get our industry out of the category of the great unknown. We must get the story of its challenging career opportunities across to the public, and particularly to students and teachers in the high schools. We've got to crystallize the industry's requirements in technical training and get the right curricula in the colleges and universities. We must support those schools teaching food science, technology and engineering. And we should get technical food courses on an accredited list.

Only through such steps can we bring the number of technical careers in the industry anywhere nearly in line with career opportunities. And that we must do to insure progress.

Meanwhile, we should take better care of the technical talent already in the field—so that we may keep them there. Statistics show that more professional people leave the food field than depart from other major industries. To hold a good man requires good pay, effective use of his talents, delegation of authority, and promise of bigger opportunity.

I am told that not all companies in the dairy, canning, and other branches of the industry are wise to these up-to-date personnel policies.

And one more point: If a dairy, canning, or other food company brings in technical high school students for summer work, it should do more with them than assign menial tasks. An effort should be made to acquaint these youngsters with the technical opportunities of the business, and to encourage them to take a technical food course when they go to college.