# WHY BOTHER WITH RESEARCH?

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While a simple question often has a simple, short answer, the answer to the question "Why bother with research" is neither simple nor short, but may be found in a thorough reflection of how research directly or indirectly affects you and your business.

First of all, just what is research? Webster defines it as "the diligent inquiry, or examination, in seeking facts or principles." It is also defined as "a systematic study of certain phenomena by the experimental method." Thus, many things which oftentimes are included in a catch-all fashion such as quality control, product testing, sales promotion or technical services are not really research but the indirect results and applications of research findings.

Who does research for you? According to the National Science Foundation, about 10,200 scientists (including 4,100 engineers) were employed by food and kindred product manufacturing companies in 1959. Compared to the total number of scientists, this is a small number. When one realizes that only 2,800 of these 10,200 scientists are actually engaged in research and development, the number diminishes still further. A contrast of the relative size and importance of the various industries with the number of research scientists employed results in ample cause for serious reflection and concern.

The Institute of Food Technologists represents an excellent cross-section of the scientists working in the interests of the food industry. A survey conducted by this organization in late 1958 and early 1959 attempted to find out what a food technologist does. Approximately 3,900 of the members responded to the survey questions. These members were engaged in 8,200 different kinds of work, of which only 22% was in the field of research (plus an additional 5% in combined teaching and research). An additional 19% of the work was in product development and another 15% in quality control.

How many of those scientists worked in the field in which we are interested? While fruits and vegetables account for a large portion of the food products today, the survey showed that only 14% of the food technologists included in the survey worked with fruit and vegetable products of all types, fresh, canned, frozen, dried, etc. The majority of that 14% worked with canned fruits and vegetables. Ten percent of the scientists were interested in food additives and other ingredients such as colorings and flavorings. Cereals and bakery products, meat products and dairy products each accounted for approximately 9% of the total. When a survey was made of the products these food technologists worked with, the total amounted to 13,600 different products.

Now -- why bother with research? The answer will differ depending upon whether one is doing research or is receiving the benefits of it. Today's research is the basis for the new products of tomorrow. It is a necessity for the companies and industries which want to keep afloat in today's competitive markets. It is of interest to note that approximately 6,000 different items are offered to the retail grocer each year. Of this 6,000 approximately 500 are accepted, but 350 of the older products are dropped from the grocers' line. The U. S. News and World Report (May 22, 1961) stated that Charles Pfizer and Company estimates that 90% of all drug products they sell today did not exist two decades ago. Estimates by many other companies show the same trend to be

true. What about the food industry? One has only to walk into our supermarkets of today and look around at the vast assortment of products being offered to the consuming public for an answer. As noted above, the food technologist of today is interested in 13,600 different products. Twenty or thirty years ago this number was approximately 2,000. Where did the increased number of products come from? One can safely say that research provided the basic information which made their production possible.

What is more important is the realization that continued application of findings, and advancement by industry, hinges upon continued research. It is estimated by McGraw-Hill that it takes an average of from 4 to 6 years for results of research to be translated into a product. Often the lag period is much longer. It must be remembered that this does not include the time spent in obtaining the results of research so that the product could be developed. Often such basic work, as in the development of equipment and techniques necessary to obtain the desired goal, consumes much of the time required of the research scientist. Within the dried fruit industry, one may cite the example of research data for the production of prune juice being developed many years before it was commercially produced. Today the production of prune juice utilizes 25-30% of the total prune production.

What about the research being done in the interest of the dried fruit industry today? The talks presented at, and the proceedings of, this research conference well document the research in this industry which has taken place during the past year or two.

These proceedings do not tell the entire story behind the research. Research breeds new research. The research of today borrows from and is supported by that which has gone on before. The epoxides, ethylene oxide and propylene oxide, are excellent examples. These compounds were synthesized in the early part of the twentieth century by a research chemist. They were soon found to be extremely reactive and, besides combining with other compounds in the synthesis of organic materials, it was found that they could combine with themselves to form polimers. These results found application in many commercial products, including many plastics used today, such as polyethylene and polypropylene. In the course of time another researcher found that ethylene oxide was toxic to insects and was so employed as an insect immigrant in 1928 for dried fruits. In the middle 1930's another researcher found that it was effective in the prevention of molding on bread. Shortly afterwards it was used to fumigate spices. A patent for its use in processed dried fruits was granted in 1945. Today fig, date, and high moisture prune packs in large part owe their popular existence to these compounds. This would not have been possible without research. Let us examine this example a little more closely. Only the final results of research are shown here. The fact that it could be used as an insect fumigant, a mold inhibitor, and later as a sterilant for processed dried fruits, is an overall view. Each of these uses required additional research. If insects could be killed by ethylene oxide, what concentration of the gas in a fumigation chamber was necessary? What was the effect of temperature? Of Humidity? Was it safe to be used? What precautions must be taken before the epoxide could be applied during its application and before removing the treated product from the fumigation room? Were there any harmful residues remaining after treatment? These and many more fundamental questions had to be answered by researchers before the compound could be applied for the usage intended. The report of the research being carried out at the Western Regional Research Laboratory today gives us proof that research is still not complete concerning the safety of the use of ethylene oxide in processed dried fruits. Similar examples of the applied results of research, often from research which is from completely unrelated fields, could be made of every topic in these proceedings. The work done on Drosophila control, moisture content studies, sulfur dioxide, packaged fruit quality, all reflect re-

search of the past as well as of the present. Determination of moisture content and the effects of sulfur dioxide have been subject to extensive research by many persons for many years and are still under investigation.

These proceedings show that research in the dried fruit industry is full of progress and many of the results have been obtained in a much shorter time than might be expected.

What about the future? Recently it was stated in the financial columns of a San Francisco newspaper that in only 30 months, two and one-half years, an average of 14¢ of every dollar the consumer was spending for products manufactured by U. S. companies will be for things not even being made today. If such is the case, then 14¢ will not be spent for products being purchased today. Why bother with research? The facts are that we cannot afford to do without it! Not if we still wish to successfully compete for the consumer dollar in today's and tomorrow's market.

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