

Developing a New Meat Product

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Introduction

The creation of a new meat product can prove desirable in value, convenience and palatability to the consumer and profitable to the manufacturer. Some products serve to utilize animal tissues, often combined with additives, that had not previously been used as a food, or to upgrade materials to more desirable foods by means of physical and chemical alterations. This session will provide an overview to goals and issues related to product development, and will include growth objectives and market analysis. In addition, the procedures by which a product becomes a reality will be reviewed, including critical parameters, establishment of prototypes, testing procedures and other details of technical development.

Development Steps

There is a lot to be said and probably a lot of things that people do not understand about product development, particularly in the meat industry. My remarks are intended to give you an overall view of the steps involved in the development of a new meat product (Table 1). There are many other systems in use that are slightly or greatly different from the one I will describe, but the one I am most familiar with, obviously, is that used by Oscar Mayer.

Product development is a very wide-ranging subject, so I want to discuss what we call value-added, refrigerated or frozen meat or meat-related products for retail sale. Developing products for retail sale is much different from developing products for foodservice. If we want to talk about foodservice product development, we can do that in the question period. The kinds of things I want to talk about will be related more closely to retail consumer products.

The first and most important thought I would like to emphasize is that the meat scientist, as the inventor of the

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Table 1. Outline for developing a new meat product.

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- I. New Meat Product Development Overview
 - A. Corporate goals.
 - 1. Growth objectives defined.
 - 2. Unique corporate characteristics.
 - 3. Businesses that fit corporate skills.
 - B. Key issues.
 - 1. Market analysis.
 - 2. Consumer input.
 - 3. Business and financial analysis.
 - II. Technical Product Development.
 - A. Critical product parameters identified.
 - 1. Consumer inputs.
 - 2. Marketing goals.
 - 3. Focusing internal resources.
 - B. Prototypes.
 - 1. Laboratory testing.
 - 2. Consumer teaching.
 - 3. Marketing research consumer product tests.
 - C. Technical development.
 - 1. Process/equipment tests.
 - 2. Scale-up tests.
 - 3. Manufacturing specifications.
 - 4. Product stability tests.
 - 5. Nonstandard ingredient specifications.
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product, is only one cog in the wheel that develops a successful new product. There is a great deal more required in developing successful new products than the invention of a new unique product or line extension. There is an extremely high failure rate in new product development. It is a very expensive and risky business, but the rewards, if you are successful, can be good. Some of the highly popular ways to fail are shown in Table 2.

One of the first and most important steps in product development is strategic planning. A good way to fail is to have no corporate objectives, no set process to develop the product and, of course, taking the panic approach to get new products into the market.

The second point, and one of the most crucial things in product development, is ignoring or rejecting any consumer inputs you might obtain. Excluding consumers entirely from the development process insures failures. If you talk to consumers and then do not believe what they tell you, that is

Table 2. Some highly popular ways to fail.**IGNORE STRATEGIC PLANNING**

- No corporate objectives.
- No set process.
- Panic approach to get new things.

IGNORE OR REJECT CONSUMER INPUT

- Exclude consumers entirely from process.
- Refuse to believe them.
- Commit to notion that they are dumb/can be fooled.
- Misinterpret what they are saying.

IGNORE ORGANIZATIONAL IMPERATIVES

- Commit too few resources to too many projects.
- Assign junior people to new products.
- Switch people around every few months.
- Allow poor communication channels to persist – no teams, no progress reviews, one-man shows.
- Do not require top corporate input as checkpoints.

IGNORE FINANCIAL REALITIES

- Do not set goals for volume and profitability.
- Do not run financial checks along the way.
- Build consumer successes that are financial failures.

also very bad. You can commit to the notion that they are dumb and can be fooled. Consumers usually have a very definite notion about what they want and they will not open their pocketbook unless they get it. Lastly, and probably one of the most easy things to do, is misinterpret what the consumers are telling us.

The third point is to ignore organizational imperatives. These are the kinds of things that can cause failure within the development organization. You can commit too few resources to too many products. You can assign junior people to new products. Junior people are usually very ambitious and anxious to get the job done, but if they have not had some experience, they can get into a great deal of trouble. This is not only true for just the R & D meat scientist, but also anybody that would be associated with the development of new products. Allowing poor communication channels to persist with no project teams or no progress reviews results in a one-man show. Those things are easy to do, but the results are usually not satisfactory. Also, if you do not consult with top corporate executives at various checkpoints during the project, the project may fail. Because these projects are expensive, it is best to make sure your top corporate policy makers are on stream with you in what you are doing, why you are doing it, what it is going to cost, how you are going to get there and when you are going to get there. You cannot communicate too many times with that kind of information because people change their minds along the way.

Finally, the reason we are all doing product development is for financial rewards. If you do not set goals for volume and profitability way up front in your project, you really cannot do anything with it. Marketing and sales put these projections together. Not running financial checks along the way, to make sure your proposition or business idea is sound, is a good way to fail. Also, there have been a lot of consumer

successes in the market place that are financial failures. You may have a wonderful product and people really like it, but you cannot make any money selling it. That will go on for a while, but eventually that product will fail because you just cannot subsidize it forever.

These are some of the situations that are easy to fall into but very difficult to avoid. We do not avoid all of them at Oscar Mayer. A final word on the failure side. Surely we all remember the Edsel. It was not a food product, but it provides us with an example of a new product that was a very large financial failure. More recently in the press is a report of the demise of RCA's video disc player. They misread where the market was going as well as the technology involved. As a result, the video disc player failure cost RCA over 500 million dollars. When considering failures, it is appropriate to mention the statistics shown in Table 3. For every 100 new products, 95 will probably fail during development within the corporate organization. Many projects and many ideas are tried before finally test marketing the product. Generally, two more products will fail in the test market. Failure at this level can cost more than a million dollars, depending on the size of the test market. One product will likely fail after national market rollout and that is the most expensive failure that you can have because you have probably committed several million dollars to advertising and promotion, capital equipment and development. Two products should succeed. It would be nice if you knew that two products of every 100 considered were going to survive. If you put a product on the market and make some money, it is a success. Then, one begins measuring the amount of success by the amount of money the product returns relative to other products. If R & D develops the product, if it gets to the market place and if it performs as desired, the meat scientist has really accomplished what he has been asked to do.

Table 3. The fate of new products.

95 fail during development.
 2 fail in test markets.
 1 fails after national market rollout.
 2 succeed.

Development Perspective

I would like now to give a brief perspective of new product development as outlined in Table 1. New product development begins with the policy-making executives. It generally is in the form of strategic planning. The financial planners and the corporate planners assess current business trends and make forecasts for the next one to ten years. Every corporation has some kind of growth target, either in dollars or volume. The growth target is generally always higher than the rate at which current business is growing. Therefore, they take the overall growth target and subtract out current business, and that is what new products have to deliver. There is obviously a minimum business size for a new product. At Oscar Mayer, we try to develop products that have mass appeal. We cannot afford to develop products that only have regional attractiveness. We are looking for high-volume prod-

ucts that will satisfy middle America. This limits us to the kind of products that everyone will like.

The next item is considering unique corporate characteristics. These characteristics could reside in research and development in the form of proprietary technology or other capabilities, but they could also be found in a highly organized and skilled product distribution system, or some production capability or some marketing and sales expertise. The point is, each corporation will try to identify and evaluate these traits. The type of new products developed will rely on these characteristics for leverage to get them into the market place. It is very important to identify what you can do and how well you can do it.

Once the overall corporate strategy is solidified and agreed upon and fits your resources, the new product development process begins by analyzing these three key issues in the context of the corporate goals (Table 1). This is where the new product ideas are generated and analyzed, based on identifying consumer needs or problems and whether the company can reasonably expect to fulfill those needs. We must, at the same time, determine if the new business makes financial sense. That is a huge undertaking and sometimes it is very difficult to get facts at this point, but it is an essential ingredient in starting the development process.

Next, we need to talk about technical product development. Consumer problems equal new product opportunities. Marketing research, the marketing product manager and the R & D meat scientist form the core group that searches out these consumer problems. Marketing research provides a vehicle to contact, question and analyze the consumer. It is a very sophisticated business. It is also a very inexact science. But it is a tool that is very valuable as well as generally quite expensive. The R & D meat scientist's role is to listen to consumers' inputs which will help the meat scientist translate into technical terms what the consumer is saying and will allow him/her to build product prototypes that will deliver what the consumer has identified as an important characteristic. The marketing group searches for and tests product concepts with consumers that will fulfill the consumer's desires. How you talk about the product, what you say about it and what characteristics it has can influence consumers' interests in an idea. Then, you have to condense this information down into something that results in a product. All these kinds of interactions generally occur simultaneously and probably without actual products for the consumer to comment on. We use drawings, photographs and other kinds of stimuli to get consumers to talk to us about the product concepts. Once this phase is complete, then the actual product prototyping starts.

Product prototyping is where the food scientist really starts getting his teeth into the matter. We will make some working models and, along with marketing research, test them with consumers. The testing may start with the internal product development people, sensory evaluation or some other appropriate avenue. Along the way, we will be asking consumers how interested they are in purchasing the product, how unique it is and whether it has a perceived value. At this stage of testing, nobody has purchased the product. We are asking hypothetical questions, and probably giving the product to consumers to take home. Of course, in this kind of

atmosphere, you get a lot of positive answers. Not one consumer has put out a dollar yet to really tell you whether they are going to buy it or not.

During this phase it is very important that the food scientist hears what the consumer is saying and translates this input into the product characteristics such as appearance, taste or texture. That is to say, he wants to build a product that will give the consumers what they want. Once the product characteristics required are defined and quantified, the food scientist's task is to complete the technical development of the product. This task goes far beyond the meat technology required because by then the technology is known and tested.

Depending upon the sophistication of the organization, the meat scientist may be called on not only to understand the product characteristics and what food technology is involved, but be required to test equipment and optimize the production process. Usually, this requires close cooperation with various engineering groups, outside suppliers, purchasing, etc. This involves interacting with a lot of people outside of the scientific world, to make the whole process successful. At this point, the marketing people are probably becoming impatient and wanting to know when you are going to get the project finished. It was supposed to be done yesterday and it looks like it will be done the day after tomorrow!

No matter how well developed the product seems in the pilot lab, changes will occur to the product when attempts are made to make it on a production basis in very large batches. At this point, the meat scientist is put to a real test of will, to insure that the product has not evolved into something that does not resemble what the consumer told us was important during the earlier phases of development. This is a very key point in development, and a very difficult thing to control. The meat scientist will have all kinds of pressure, from several different sources, to make the product as soon as possible. The question is, "How far away are you from the ideal product?" At that point, there may also be some consumer testing done, to go back and verify how important some of these characteristics are if you need to change them.

One of the meat scientist's most important hurdles is producing a written manufacturing specification that will be used by operations to produce the product, by the accounting department to track the cost of the product, by the purchasing department to buy the materials, and by the quality assurance group to maintain product quality and consistency during production. Since refrigerated meat products are highly perishable, a considerable amount of product stability testing is done to make sure the product has a sufficient shelf life. It takes many weeks for a product to get from the plant to the home refrigerator. If you cannot supply adequate shelf life, you really do not have a marketable product.

The last topic I will mention is entitled, "non-standard ingredient specifications." If an ingredient used in the new product is new or unique to the company, a specification must be developed so that the purchasing department can buy the new ingredient and the quality assurance group can monitor the quality and consistency of the ingredient. The meat scientist may be asked to evaluate alternate suppliers for the ingredient. Sometimes, this can require a whole testing program by itself.

Test Marketing

Another crucial phase of product development is the test market. This is really critical to the product's life because you probably have not made it in very large quantities at that point. You have made as much as you can afford to distress or throw away. In the case of meat products, that is very expensive, but in total overview of the whole project, it is probably insignificant. Several thousands of dollars in distressed product costs seems like a lot of money, but the promotion program alone, including television advertising and the like, will be many times more expensive. Once the

marketing plan, sales organization and promotion money are committed, one must be absolutely sure that the product can be manufactured consistently to specifications. The meat scientist is one of the key people who is put on the spot to make sure that this happens. Trying to start up a new product with new people and a new line can be very difficult. The meat scientist plays a very important role. The scientist knows how to make it, knows it can be done, and all that is left to do is make sure the other people learn. Sometimes, that is a real tough task. You have a lot of moral support, but the bottom line is that if the meat scientist has not done the proper homework, the product is not going to go anywhere.

Discussion

D.T. Bartholomew: What is the cost breakdown as far as advertising versus product development cost of your product? How would you break that down for a new product?

Suess: It would depend on how different the technology is that you are going to be using to make the product. If you start from scratch, and develop a whole new line to produce a product, that could be very expensive. Capital outlay for equipment and facilities could be the largest initial cost. Generally, that money is not spent until after you have successfully completed test marketing. Usually, the product development cost would probably be 10% to 20% of the total project cost. The advertising that is spent in test markets can be a big cost. After test market, the largest cost may be the capital investment in the first year. This could run anywhere from a few hundred thousand to several million dollars, depending on the complexity of the project. Some firms use co-packers to make the product. They are contracted to make your product until you are sure that the project warrants a large capital investment.

Bob Henrickson: What is the time from concept to acceptance?

Suess: Too long! We have a goal to have a project pay out in three years. If we do not think it is going to do that, we do not proceed with it. Usually, if it takes more than that, the project may experience problems. The economics can change while you are developing the product. Meat prices might change radically over the time that you have tested the prices with consumers. Your proposition may be dead because price has changed radically.

Henrickson: How do you feel about blends of meat rather than just one commodity?

Suess: From the technical side, it is very exciting. I think that is where the future will be. From the consumer side, it is very difficult for them to understand what you are doing. We are in the processed turkey business. You can take some turkey meat, blend it with pork and beef, and make some fine processed meat products. But the consumer is not used to such products. They might be interested, but it would be a very expensive educational program. I think there will be a blending of species in the future because the low-fat characteristic of poultry is very desirable. Blended with some of the pork attributes, you can make some products virtually like you know them today, but they will not be made of the same ingredients. I think it will come eventually.

Bob Benedict: In that aspect, what would be the effect of the federal regulations on additives, mixing the different types of species, state regulations and also consumer groups opposed to high-fat foods?

Suess: Well, as far as the high-fat foods, I do not think that has a lot to do with species. Many of the meat products have standards of identity, not only for fat content and moisture content, but also species to a certain degree. You can put 15% turkey or chicken into a hot dog today, and put it on the ingredients label. But if you put more than that, you will have to start calling it a pork and turkey hot dog or something like that. The USDA says you have to tell the consumer what you are doing. It is not fair to say that it is still a hot dog when it is not a hot dog the way it was previously defined. That does not mean you cannot get the rules changed. That is sometimes very difficult and you have to have a lot of fortitude. The reward at the other end must be very well defined, because to get the regulators to change the rules and establish a new standard is a very long process. You have to be very careful because you may get yourself into a box that you do not want to be in. You may think that you wanted certain product characteristics limits on the product, but once it is in the marketplace, you may find more of this and less of that is desirable.

Bill Schwartz: Would you let me answer that question in a little different way? Quite obviously, the regulations get in the way of doing things. That is essentially what Suess is saying. The fat issue that you raised is a common one that he and I both deal with right now, because we recognize the consumer's ideas calling for lower fat products. It was discussed yesterday morning in the session. But, how do you get there under current regulations? The regulations were developed for an entirely different category of products. Most consumers do not recognize how terribly protected they are by the USDA. USDA people in the regulatory approach, write a lot of consumer definitions that they do not really recognize as such. They will set a category or standard without any consumer research, without consumer input, but that is the way they will define how they are going to interpret that regulation.

Benedict: I think then that you ought to have the USDA or state included, because they may have more of an effect than corporate strategies.

Suess: Usually we do not start with trying to change the