Managing research and development in food-processing or beverage companies is difficult because it is hard to demonstrate the value R&D provides with regard to food or beverages. For example, managers outside the R&D group in a pharmaceutical company never question the value of R&D because it is clear to all that R&D is needed to develop new drugs. Managers outside the R&D unit in many food-processing and beverage companies, however, are just the opposite: they rarely appreciate the value of R&D. Similarly, whereas most consumers expect electronics and computer industry research and development groups to generate technical breakthroughs, few expect them with regard to food and beverages.

Although these outside managers and consumers do expect food and beverage companies to work at refining their current products so that they contain less salt or fewer calories, a technical breakthrough, per se, is not what is usually thought of when one thinks about either food or beverages. Consequently, R&D is not valued as highly and therefore less is spent on R&D in these companies. Certain kinds of pharmaceutical companies, for example, may spend up to 20% of sales on R&D, and electronics and computer companies often spend up to 10% of sales on R&D. Food-processing companies, on the other hand, spend an average of 0.8% of sales on R&D. Beverage companies spend even less—typically around 0.3% of sales.
In addition, in pharmaceutical, electronics, and computer companies, there are usually a few senior business managers who have a background in R&D. In food and beverage companies, however, almost all senior business managers have a background in marketing with little knowledge of or experience in dealing with the research and development arm of the company.

R&D managers in food-processing and beverage companies therefore may need to spend much more time than their counterparts in other industries do in justifying the R&D function. It may be a constant struggle for them to carry out as much long-term R&D as they feel their companies need. In addition, they may have to spend much more time encouraging their R&D staff to take the initiative—and to create technical advances for their companies.

To surmount these challenges, these managers must determine which practices are workable in their own situations. They must realize that what might be workable in pharmaceutical, electronics, or computer companies may or may not work for them. A good indicator of what will work for them is whether the practices have worked out well in other food and beverage companies. This chapter identifies world-class R&D practices that have been successfully implemented in food and beverage companies; these are divided into four areas:

- The management of R&D within the R&D organization.
- The coordination of R&D with the rest of the company.
- The management of the company as a whole, particularly management practices that affect the management of R&D.
- The management of resources and the maintenance of an innovative climate.

A study of 38 R&D organizations in food-processing and beverage companies also identified these four areas as the four kinds of challenges such R&D groups are facing. For example, the first challenge any R&D organization encounters concerns the management of R&D internally, including such activities as selecting R&D projects and strengthening the R&D management processes. Only after the challenge of managing R&D is overcome can the challenge of coordinating R&D with the rest of the company be addressed. This involves coordinating R&D and marketing as well as transferring technology to manufacturing.

After this challenge is overcome, the R&D organization faces a challenge that it can only partially control or address—the challenge of managing the company as a whole. This involves establishing a process for developing new products and managing company operations in general, particularly those that affect the management of R&D.

Finally, even after the challenge of managing the company as a whole is overcome, the R&D organization must continually work at managing resources effectively in order to take advantage of new opportunities and maintaining an innovative climate in order to seize these new opportunities.
Roughly speaking, 17 (or 45%) of the 38 R&D organizations are still addressing problems involved with the management of R&D; 12 (or 32%) of the 38 are addressing problems involved with coordinating R&D with the rest of the company; 7 (18%) are addressing problems related to managing the company as a whole; and 2 (just 5%) are addressing problems related to managing resources or maintaining an innovative climate.

Although these percentages may seem to indicate that there has been little progress regarding the management of R&D in food-processing and beverage companies, the percentages for, say, R&D organizations of pharmaceutical companies would not be altogether different—despite the fact that the R&D is more highly valued in pharmaceutical companies. In fact, because of their large size, most pharmaceutical R&D organizations deal with similar problems related to the management of R&D. The size of these groups and large number of discovery scientists in them both contribute to ongoing communication problems, and pharmaceutical company discovery scientists in particular often resist improvements to the R&D management processes.

Furthermore, given the long lead times related to market opportunities for drugs in the pharmaceutical industry and differences in mentality that exist between scientists and manufacturing people, problems in coordinating R&D with the rest of the company are prevalent. Because of the long lead times related to market opportunities—and because a high level of technical or medical knowledge is often required to identify market opportunities in the first place—many problems exist regarding how well R&D people and marketing people work together in defining new market opportunities.

In addition, R&D organizations and manufacturing organizations in pharmaceutical companies encounter many of the same problems of transferring technology that their counterparts in food and beverage companies do because manufacturing organizations in both industries are under pressure to produce. Furthermore, some scientists in pharmaceutical companies—like some of their counterparts in food and beverage companies—have difficulties in understanding manufacturing operations.

**MANAGEMENT OF R&D**

Before considering world-class practices related to the management of R&D in food-processing and beverage companies, it is useful to outline how R&D organizations that need to improve the most in this area currently function.

The basic problem in many of these R&D organizations is that they mainly react to the marketing organization’s demands. The R&D organization in these companies is considered to be only an implementer—that is, as an organization that does what it is told to do. In such a culture, the R&D organization has little say in how things should be done.

R&D people in this situation are often demoralized. Because their talents are not appreciated, they stop looking for creative ideas. R&D project planning also suffers in such a company. Not only does the marketing organi-
zation define what needs to be done, but it also indicates when the R&D should be completed. Having deadlines for R&D projects made completely outside the R&D organization makes R&D project planning seem useless. Finally, because the R&D organization reacts, on the whole, to marketing, there is very little done in the way of long-term, technical or strategic planning.

World-class practices related to strengthening the management of R&D concern four areas:

- Improving the selection of R&D projects.
- Strengthening the R&D management processes.
- Establishing productive relationships with outside groups.
- Improving the infrastructure of the R&D organization.

Each of these is discussed in the following sections.

**Improving the Selection of R&D Projects**

The key to improving the selection of R&D projects is developing a discipline or framework within the R&D organization for how R&D projects are selected. Most R&D organizations in food-processing and beverage companies have plenty of ideas about what to do, but unless they clearly set a direction and define a framework for evaluating and selecting R&D projects, the best ideas may not be pursued.

A number of R&D organizations have successfully implemented formal project selection processes that help ensure that the best ideas are pursued. For example, one food-processing R&D organization uses a graph to highlight the relative risks and rewards of possible R&D projects. The graph is simple—the probabilities of technical and commercial success or failure of possible R&D projects are lined up on one axis; and the potential values of the possible R&D projects are lined up on the other axis. These are only rough measures, but they are enough to allow the R&D managers of this company to gain a better perspective on what their options are.

In a beverage company, an R&D organization has developed an R&D project selection process that consists of evaluating all R&D proposals first in terms of one of four categories—typically the person proposing the project initially determines which category is most suitable for the particular project:

- Product quality improvements.
- Productivity improvements in manufacturing.
- New product or market developments.
- Exploratory R&D.

Each category encompasses several criteria for evaluating R&D proposals; the criteria for the first category, product quality improvements, are as follows:
First, the R&D person who proposes any R&D project evaluates it on a scale of 1 to 10 for each of the criteria, and different weights are given to different criteria. For example, the first criterion used in evaluating product quality improvements (quality of consumer data) might have twice the weight of the second criterion (criticality of consumer, wholesaler, or retailer concern).

After the R&D person evaluates his or her R&D proposal, an audit of the evaluation is conducted to make sure it is accurate. Afterward, review teams, which include representatives from marketing, sales, manufacturing, engineering, finance, and international operations, evaluate the R&D proposals in each of the four categories. The review teams also evaluate all of the R&D proposals in terms of:

- Whether they involve low, medium, or high risk.
- Whether they could be completed in the short, medium, or long term.
- Whether they would have low, medium, or high impact.

Another food-processing company R&D organization has established a successful approach for identifying specific areas in which to conduct R&D. This approach involves identifying weaknesses in a company’s products. For example, this R&D organization identified problems in preserving the shelf life of some company products that spoiled easily, such as meat or dairy products. As a result of the R&D that was done, many products that used to spoil well before 45 days are now staying on the shelf for much longer than 45 days. This R&D, of course, has provided the company with many benefits, such as cutting down on expenses of product recalls and replacements. To carry out this R&D, however, the R&D organization had to overcome the resistance of a marketing organization that did not see the benefits at first.

Last, a beverage company R&D group established a system of zero-base budgeting, which requires that all R&D projects be justified every year. Even though the efforts to establish this system met resistance from some members of the R&D organization itself, the group found that forcing an evaluation of all R&D projects—ongoing ones as well as new ones—provided many benefits.

For example, the company had been working with a container manufacturer to develop new technology for manufacturing containers. Through evaluations caused by zero-base budgeting, the R&D organization realized that this R&D was outside of the company’s business focus and should be conducted solely by the container manufacturer. On the other hand, the R&D organization also discovered through zero-base budgeting that it should continue funding R&D
related to a key ingredient in its beverages. Even though one of its major competitors did not conduct any R&D related to this key ingredient, the R&D managers realized that knowledge about this ingredient was one of the company’s core competencies and had to be maintained.

**Strengthening the R&D Management Processes**

Strengthening the R&D management processes can include improving R&D project planning, identifying the long-term technical capabilities needed within an R&D organization, improving the design of products, and setting higher standards related to carrying out technical work. In addition, studies launched to identify the causes of failure or compare R&D spending in various areas can also provide a new perspective on R&D management processes in general.

**Improving R&D Project Planning.** The R&D organization of a beverage company learned how to plan better by identifying not only the final objectives of a long-term R&D project, but also the group’s overall objectives for the coming year. By doing this, the R&D organization learned how to define its milestones more concretely and could therefore explain the progress of its long-term R&D projects more effectively to its internal customers.

**Identifying the Long-Term Technical Capabilities Needed Within an R&D Organization.** A food-processing R&D organization developed an approach that allowed it to focus its exploratory R&D more effectively. The first priority was to identify those technical skills that would be needed in three to five years—that is, the long-term technical skills the company would need to stay competitive in the industry. This task turned out to be much more difficult than imagined because the identification of such technical skills was threatening to those in the R&D organization who did not have these skills. First-line supervisors resisted hiring technical people whose work they did not understand. Other technical people felt threatened because their technical specialty was no longer so highly prized. Nonetheless, the first step was to have a dispassionate analysis of what would be needed. Based on this analysis, training programs were devised. Finally, based on such an analysis, exploratory R&D projects were launched that fit those long-term technical needs.

**Improving the Design of Products.** An R&D organization of a food-processing company regularly uses a technique of product optimization (i.e., the Taguchi method of experimental design) to study all of the interactions of variables in a product design. Although the R&D people at first resisted using this technique because they believed it ignored the “art” of designing, eventually they accepted the approach.

The value of using this approach is not only that new products are designed more effectively, but the R&D organization gains a fundamental
understanding of how the variables related to the product design interact. Thus, when the R&D organization needs to alter these variables for whatever reason, it could simply reviewing the reports from its previous experiments to determine the likely effects of the changes. The next challenge for this R&D organization is to utilize this same technique for analyzing the raw materials that are used in its products.

**Setting Higher Standards Related to Carrying out Technical Work.** One food company R&D organization uses recipe models of what a product, such as pasta or vegetables, should taste like if it were made from fresh ingredients. It uses these recipe models as a means of setting technical objectives for developing new packaged foods. By challenging R&D people in this way, this R&D organization has spurred the R&D people to achieve standards of technical excellence that they would not have met if they had been left to meeting their own ideas about the objectives.

**Launching Studies of the R&D Management Processes.** Such studies can yield unexpected insights. For example, an R&D organization of a food-processing company studied the causes of its unsuccessful R&D projects. It learned that a couple major causes—such as having an unclear definition of a project’s objectives and inadequate resources—were making many of its R&D projects fail. Other R&D organizations have compared how much they were spending in various technical areas with what outside organizations—either similar R&D organizations or contract R&D organizations—were spending. One food-processing R&D organization learned that it was spending too much on new product development and not enough on analytical services. Another food-processing R&D organization learned that it was doing the opposite—spending too much on analytical services and not enough on new product development.

**Establishing Productive Relationships with Outside Groups.** Most R&D organizations in food-processing and beverage companies are still learning how to work effectively with groups outside the R&D organization as well as outside the company itself. Most of these groups are quite good at recognizing what they are not good at with regard to R&D. Working productively with outside groups, however, depends only partially on being able to recognize one’s technical limitations. To work productively with outside groups also requires such other abilities as being able to build trust, to listen to and accept alternative viewpoints, and to work cooperatively over an extended period of time with groups that have different goals.

Traditionally these abilities have not been especially valued in R&D organizations. In most food-processing and beverage R&D organizations, in fact, technical brilliance has almost always been rewarded much higher than, say, the ability to work effectively with outside groups. Consequently, to improve in this area, these groups must change their systems of rewards.
A few food-processing and beverage company R&D organizations, however, have made a lot of progress in this area. For example, the R&D organization of one food-processing company has developed strategic alliances with 42 outside organizations. These strategic alliances are aimed at developing technology in a variety of areas. One of this R&D organization’s goals is to help position the company into more value-added businesses. One strategic alliance involves an effort to utilize the company’s knowledge of fats for developing oils to sell to the cosmetic industry.

An R&D organization of a food-processing company has a well-defined practice of using another type of outside expert—a technical consultant—to solve practical problems. For example, if this R&D organization attempts to do something in which it has almost no experience, it seeks out a retired person (probably from another company) with specific experience in the particular area. Unlike many food and beverage R&D organizations, this group only uses academic scientists if there is a specific match between the technical problem and the academic scientist’s capabilities or if the academic scientist has a unique understanding of the company’s businesses.

Other R&D organizations have developed close relations with outside suppliers. An R&D organization of a beverage company works with more than 50 outside suppliers, which provide the company with flavors, stabilizers, sweeteners, and other ingredients. This R&D organization has developed close working relations with nearly half of these outside suppliers. When either the R&D organization or these outside suppliers want technical advice, they regularly call each other. A different R&D organization in a food-processing company has developed such a close relationship with one of its outside flavor suppliers that it trusts the supplier to do the research related to these flavors.

Company consumer affairs groups also traditionally have not had a close relationship with food-processing or beverage R&D organizations. At times consumer affairs groups and R&D organizations have even been adversaries. In one food-processing company, however, the consumer affairs group is now part of the R&D organization. In this capacity, it has helped the R&D organization learn more about problems with products and has helped guide new product development.

Finally, another food-processing R&D organization brings in both consumers and supermarket representatives to define what kinds of new products are needed—or just what could be done better. By participating in focus groups with consumers—and by having lengthy discussions with managers of supermarkets—this R&D organization has been able to define much more precisely what it should develop or improve.

**Improving the Infrastructure of the R&D Organization**

The infrastructure of an R&D organization involves the various systems that support the day-to-day work. A common element in many of these systems is the creation and transfer of information within an R&D organization.
For example, an R&D project management system can help everyone in an R&D organization gain a better understanding of what is being done. A computer information system, on the other hand, provides a way in which all R&D people—particularly R&D people at a variety of sites—can exchange information. Finally, a system for measuring R&D performance provides an overall perspective with regard to how an R&D organization is doing.

In one food-processing company, a corporate R&D planning group established an R&D project management system that reports basic information about all projects, such as the type of project, its costs, its schedule, and the use of the R&D. At first the corporate R&D planning group met resistance from the R&D people in establishing the project management system, but eventually the corporate R&D planning group got the information it needed so that it could evaluate the use of resources across the entire R&D organization.

On the basis of this evaluation, the corporate R&D planning group determined that too many resources were being used on quality improvement projects and on technical services. Although these projects and services had value, too often they were conducted more to reach some corporate goal related to doing a certain minimum of projects than to accomplish an important objective. Thus, this R&D project management system provided information that turned out to be useful in selecting R&D.

Another food-processing R&D organization established a computer information system that has information on all of the company’s R&D projects. Any R&D person in the company, therefore, can find out what is going on in any of the company’s worldwide R&D centers.

Finally, an R&D organization of a food-processing company has developed a portfolio of measures related to R&D performance. The value of this system is that it captures a wide variety of aspects of R&D performance. For example, the metrics for R&D as a whole are:

- Value produced.
- Portfolio assessment.
- Business linkages.
- Competitive assessment.
- R&D practices.

The value produced equals the gross sales minus the costs, which yields an R&D return. In calculating these figures, R&D that has affected more than one business would get more than one sum. Portfolio assessment concerns having the right balance in the portfolio, which the R&D managers have to evaluate in terms of their own criteria. Business linkages concerns how much R&D is funded by various businesses. Competitive assessment involves how the R&D organization compares with competitors’ R&D organizations. R&D practices relates to various management practices, such as the transfer of technology to manufacturing.
In addition, this R&D organization also evaluates each R&D project in terms of: incremental sales, cuts in purchasing costs, operating improvements, such as improvements in yield or materials, and quality or shelf life improvements, which could involve avoidance of certain costs or the extension of the shelf life of products.

Finally, this R&D organization looks at all of this information about R&D performance from a historical perspective. In other words, it views R&D as something that flows through a pipeline, which both extends into the past and produces results in the years to come. In doing this, the R&D organization considers an eight-year period—four years in the past, the current year, and three years in the future.

**COORDINATION OF R&D WITH THE REST OF THE COMPANY**

Before considering world-class practices related to the coordination of R&D with the rest of the company in food-processing and beverage companies, it is also useful to outline how R&D organizations that need to improve in this area currently function. These R&D organizations, on the whole, manage R&D effectively within the R&D organization. To coordinate R&D with the rest of the company, however, naturally includes more than what the R&D organization itself can do. The rest of the company (i.e., marketing, manufacturing, sales, purchasing, finance, quality assurance, and the general manager) all has to do its part.

Because R&D is not as highly valued in food-processing and beverage companies, the rest of the company may not be as motivated to work effectively with the R&D organization. Many food-processing and beverage companies can continue to make excellent profits in their established product lines if they simply market and produce their products well. So although the rest of the company will continue to want technical support from the R&D organization to maintain these established product lines, it may not want traditional R&D. Because of this, many R&D organizations in food-processing and beverage companies have problems working with the marketing organization in developing new products and with the manufacturing organization in transferring technology.

Marketing people in many food-processing and beverage companies are good at developing product extensions, but not nearly as good at developing new products, especially new products that will take much longer than two years to develop. Manufacturing people in many food-processing and beverage companies are good at producing existing products on time and within cost, but not nearly as good at introducing new technology into the plant.

In addition, few food-processing and beverage companies have a long-term business strategy. Instead they have financial plans that often do not address what kinds of new products or manufacturing improvements are needed to meet the financial goals indicated in those plans.
Finally, in most food-processing and beverage companies the relationship between the R&D organization and the finance organization is not as good as it should be. Most R&D people do not understand much about finance, and most finance people do not understand much about R&D. Because of this weak relationship, further difficulties arise in trying to get the value of R&D appreciated in these companies.

To improve the coordination of R&D with the rest of the company, four types of things must be done:

- The R&D organization can take specific steps to improve this coordination.
- The R&D organization can explain the value of R&D more effectively.
- The rest of the company can take specific steps to improve this coordination.
- The R&D organization can utilize financial approaches related to R&D to improve this coordination.

Each of these is discussed in the following sections.

**Steps the R&D Organization Can Take to Improve Coordination**

To improve the coordination of R&D with the rest of the company, the R&D organization has to take the initiative—educating the rest of the company and building bridges wherever it can. As mentioned, food-processing and beverage companies often can manage quite well in many of their established product lines with only the need for technical support. The R&D organization, therefore, has to go the extra distance to demonstrate the value of R&D to the rest of the company.

Besides demonstrating the value of R&D, however, R&D organizations in food-processing and beverage companies can take specific steps. For example, the R&D organization of one food-processing company utilizes brand requirements related to health factors as a means of proposing R&D. The more that this R&D organization can get marketing people to realize that R&D is needed to cut the percentage of fat or to eliminate the use of sodium in the company’s products, the more likely its chances of having the results of its work used by the company.

Another food-processing R&D organization built a new pilot plant to test new products. This R&D organization invites manufacturing engineers—and manufacturing people from the manufacturing lines—to work closely with the R&D people to make new products manufacturable. At times these members of the manufacturing organization spend weeks at the pilot plant. Later, of course, these same manufacturing people champion the technology when it is introduced in the plants.

The R&D organization of a beverage company is learning to work more closely with its sales organization. It turns out that there are many opportunities related to developing new products that retailers—not consumers—can help identify. Even though the marketing people in this company play a larger
role in developing new products, the company’s marketing people—like all marketing people—traditionally focus on the consumer, not on the retailer. Because of this, they miss certain things.

For example, the R&D organization found out through the sales staff that consumers in countries with a tropical climate like to have eight-ounce cans of beverage rather than 12-ounce cans. Because of the heat in these countries and the lack of air conditioning, any beverage that is not drunk quickly becomes flat and warm before it is consumed. On the basis of this information, the R&D organization took the lead in sponsoring eight-ounce cans in such countries.

R&D organizations in food-processing and beverage companies also need to conduct customer surveys with their internal customers. For example, a corporate R&D organization of a beverage company conducts surveys with all of its internal customers (in this case the leaders of the various divisions for each product) with regard to its work. These surveys cover three areas:

- An evaluation of the corporate R&D organization’s processes.
- An evaluation of the internal customer’s own efforts in guiding R&D.
- An evaluation of each of the individual R&D projects done for that customer.

In addition, R&D organizations in food-processing and beverage companies can improve coordination with the rest of the company by helping the businesses in other ways. For example, a beverage R&D organization has demonstrated that it can be an important vehicle for improving communication between outside organizations (e.g., organizations that have a joint venture with the company), consultants, and the company’s own business people. The R&D organization of another beverage company draws upon its knowledge of the company’s businesses to advise not only about technical matters, but also about marketing and manufacturing issues.

Finally, an R&D organization of a food-processing company reorganizes every time the marketing organization in its company reorganizes. This R&D organization found that the best way to preserve the coordination with marketing is to help R&D people and marketing people focus on the same business concerns, which can be disturbed if the marketing organization reorganizes. To have the R&D organization reorganized in the same way as the marketing organization preserves this coordination.

**Explaining the Value of R&D to the Businesses**

There are a number of ways in which an R&D organization in food-processing and beverage companies can educate the rest of the company with regard to the value of R&D. For example, one food-processing R&D organization explains the value of R&D primarily in terms of applications, such as in improving food safety or dealing with environmental regulations or cutting
costs. Another food-processing R&D organization conducts science fairs for business managers in order to allow them to see science at work. In these science fairs the R&D people have exhibits with posters and demonstrations.

Another food-processing R&D organization explains the value of R&D in terms of stocks, stock options, and insurance. The stocks in this analogy are the R&D that has always paid off. The stock options are the R&D that has not been utilized yet. Just as stock options could eventually pay off, this R&D also could eventually pay off. Finally, the insurance is the R&D that is aimed at preventing safety or regulatory problems.

A beverage R&D organization has developed an approach for explaining the value of R&D through evaluating unsuccessful R&D projects to see what resulted from them. For example, the R&D organization studied several of its unsuccessful projects and found that some of them spawned other projects. One of these projects resulted in 10 new R&D projects being initiated. Of these 10 new R&D projects, 5 of them were successful. This approach, therefore, allows this R&D organization to tackle one of the most difficult questions that non-R&D people ask: What is the value of an unsuccessful R&D project?

Finally, a food-processing R&D organization has developed an approach for explaining the value of corporate R&D, which is also very difficult to explain to non-R&D people. Because a significant fraction of this R&D organization’s work could not be justified if it were only aimed at one business, it has found ways of looking at this technical work that helps many businesses within the corporation.

For example, some technical advances—such as infused meat, which is a method of adding more meat to a soup without increasing the cost, and certain analytical techniques, which could aid in the analytical tests of many businesses—could never be done for just one business. By tabulating the value added across several businesses—and then explaining this value to non-R&D people—this R&D organization has been able to educate the rest of the company about the value of corporate R&D.

**Steps the Rest of the Company Can Take to Improve Coordination**

The rest of the company can also do things to improve the coordination of R&D with the rest of the company. Most of what the rest of the company can do involves participating in shaping R&D so that it meets the company’s needs. The more that marketing, manufacturing, and other functions in the company get involved constructively in helping shape R&D, the more likely the R&D group will meet those needs.

Specifically, marketing people need to work closely with R&D people in defining what R&D should be done. For example, in a beverage company the R&D people and the marketing people work closely together defining both the company’s technical needs in the long-term and future market opportuni-
ties. The R&D people use a form of technology forecasting to identify long-
term technical needs, and the marketing people analyze long-term market
trends with an eye toward identifying new opportunities.

The marketing organization of another beverage company encourages its
people to work closely with individual R&D people. Although the company
is marketing-driven, at the working level there are excellent partnerships
between individual R&D people, individual marketing people, and individual
market research people.

The great advantage of these partnerships at the working level is that the
core team of a new product development, which usually involves just one
R&D person, one marketing person, and one market research person, is very
effective. Having such an effective core team helps enormously during the
initial stages of new product development. In most companies the problems of
a new product development crop up during the initial stages because the new
product concept is not defined clearly. In this company, however, this core
team usually does an excellent job in defining the new product concept.

After the core team has defined the concept clearly, it then uses the
expertise of other functions (e.g., process development, package development,
manufacturing, and purchasing) to determine how to implement the concept.
When these other functions are brought on the project team, however, the
tasks are usually straightforward and involve implementation questions.
These other functions can operate very effectively in these circumstances.

Manufacturing people also have to get involved in shaping R&D to meet
their needs. In most food-processing and beverage companies, manufacturing
people are not even involved in selecting R&D, which usually is done by
R&D people and marketing people. In one food-processing company,
however, the manufacturing people are just as involved as the marketing
people are. Just as marketing people should have a major influence in the
selection of product R&D, manufacturing people should have a major
influence in the selection of manufacturing R&D. By viewing R&D as helping
the whole business—that is, as not solely focused on product needs—this
R&D organization has been able to help the company in more ways.

In addition, manufacturing people should pull technology to the plants
rather than expect R&D people to push the technology into the plants. Unfor-
tunately, because of the way in which most manufacturing organizations are
held accountable in food-processing and beverage companies, this does not
usually happen.

In cases in which a manufacturing plant does pull the technology, it is
usually because the plant is tightly tied to a specific business so that the fate
of that business affects the fortunes of the plant. In these cases, the plant
managers want new technology as much as the R&D people want to give it
to them. For example, in one food-processing company, the plant manager
was the champion for a new technology. He invited R&D people to work in
the plant in order to transfer it effectively and made funds from the plant
budget available to help pay for the transfer of the technology.
Finally, in another food-processing company, management information systems people participate on new product development teams. In doing this, they help the new product teams by making sure that the information that is needed for developing a new product will be available throughout the development.

**Financial Approaches to Improving this Coordination**

One of the great values of using financial approaches to improve the coordination of R&D with the rest of the company is that financial data is what makes the most sense to business managers. Consequently, the more that financial approaches are used in evaluating R&D, the better. Only a very few food-processing and beverage R&D organizations, however, take enough advantage of these financial approaches.

One beverage R&D organization, for example, relies on a finance person to measure R&D payoffs. This finance person has developed financial models for evaluating the future revenues of new product developments and measuring the payoffs of these same new product developments. This finance person has also developed an approach for measuring product quality through the use of such models.

In one food-processing R&D organization, a finance person is responsible for making financial evaluations of R&D that are acceptable to both R&D managers and business managers. Two of this finance person’s major responsibilities are to determine the total investment needed to exploit a business opportunity that stems from R&D (e.g., the cost of R&D, capital, advertising, marketing promotion, and manufacturing) and to help senior business managers decide about the allocation of R&D resources.

**MANAGEMENT OF THE COMPANY AS A WHOLE**

How a company is managed as a whole affects the management of R&D, just as it affects the management of marketing, of manufacturing, and of other functions. For example, if there is not a defined way of developing new products, the R&D organization not only has to do the technical work needed in developing a new product, but also has to coordinate the entire new product development process. In many food-processing and beverage companies this is often the case.

Similarly, if the market research organization is weak or ineffective—as it is in many food-processing and beverage companies—the R&D organization conducts R&D without a well-defined target at which to aim. Or, if the manufacturing organization is not managed effectively, particularly with regard to the introduction of new technology into the plant—which is common in many food-processing and beverage companies—the R&D organization faces problems in transferring technology to manufacturing. If the accounting organization does not put together data in a way to help a company evaluate
R&D spending or spending for new product developments—which is the case in many food-processing and beverage companies—it is hard to make meaningful decisions about R&D spending or spending for new product developments.

In short, R&D cannot be managed in isolation. If the company as a whole is not managed well, it becomes very difficult to manage R&D well. Two areas are considered in looking at world-class practices:

- New product development.
- The management of company operations, particularly management practices that affect the management of R&D.

Each of these is discussed in the following sections.

**New Product Development**

The first—and easiest—step in improving how new products are developed is to define the process. Because it is the easiest step, many food-processing and beverage companies have been able to lay out how the process of new product development is supposed to go. The trick, however, is to actually develop new products in accordance with this new product development process—unless justifiable reasons can be made for circumventing the established process. It is in the execution of new product developments that many food-processing and beverage companies fall short—for many reasons.

In some cases, the R&D organization feels certain about the technology and wants to avoid a review of its work. The marketing organization may want to skip consumer testing in order to beat the competitors to the marketplace. Or the manufacturing organization is confident about its knowledge about a product and wants to get around an initial production run. Whatever the cause, ways are found to go around the new product development process.

When this occurs, not only is that new product development hurt, but the new product development process is undermined. Once this process is undermined by one company function, it is then in jeopardy of not being followed by any of them. Consequently, the trick here is simple, but tough to follow—senior managers have to make sure that the process of developing new products is followed.

One excellent example of a company that follows a new product development process involves a beverage company. Its new product development process, which is a set of procedures that could be found in most articles on new product development, is as follows:

- Idea.
- Concept.
- Concept and prototype evaluation.
- Project team formed.
- Product/process/package development.
With few exceptions, this beverage company always follows this process. The few exceptions involve efforts by the marketing organization to get enough samples to bring to the market directly to see whether the samples will sell. These efforts by the marketing organization involve simple line extensions of products, however, which are justifiable reasons for circumventing the process.

One food-processing company is working to establish a model of new product development. This model goes beyond just establishing a new product development process that is always followed and involves encouraging all functions—not just the marketing and sales organizations—to be sensitive to customer needs.

According to this model, each function in a company has a special set of skills, such as being able to conduct R&D, develop marketing promotions, or manufacture products. However, rather than each function specializing only on using its set of skills with the marketing and sales organizations controlling the definition of customer needs, each function also provides input into the definition of customer needs. This allows everyone in the company to be more knowledgeable about the marketplace.

Finally, another food-processing company changed the paradigm concerning how things are done in its new product developments. The company previously defined the requirements of a new product based on its best insights concerning customer needs. It then developed the new product based on these requirements.

After encountering several failures, however, this company learned how to work more closely with customers throughout the new product development. For example, for a pasta product, rather than deciding about the taste at an early stage of development, this company continued to ask customers which taste they preferred (e.g., creamy, cheesy, or buttery). For a vegetable medley, rather than deciding at the outset which vegetables should be included, this company continued to test various mixes of vegetables with customers as the new product development proceeded.

Management of Company Operations, Particularly Management Practices that Affect the Management of R&D

What other functions, such as marketing, manufacturing, and finance, do affects how well R&D is managed. This also means that when these other
functions operate effectively, they can help the management of R&D enormously.

For example, one of the great strengths of one beverage company is its market research organization, which was the product champion for one of the company’s most successful new products. During the many years that this new product was developed there were a number of difficulties that needed to be overcome. To overcome them, the product had to be reformulated many times.

Nonetheless, throughout this process the market research organization believed that the new product had great appeal because the consumers who tested it liked it even though the product did not taste quite as good as other alternatives did. This was because the product was so convenient to use. Because of the market research organization’s persistence, this new product eventually succeeded.

At another food-processing company, improvements in the supply chain (i.e., the process starting with the suppliers and ending with the delivery of products to a retailer) helped the R&D organization become more effective. The first step in the strengthening of the supply chain involved merging the manufacturing, purchasing, and logistics organizations under one senior manager. Traditionally these three functions had worked at cross-purposes. The result of this merging laid the basis for many improvements in how all the supply chain processes were carried out.

These improvements not only helped cut costs but made it much easier for the R&D organization to work with the functions involved in the supply chain. Because these functions understood their own operations better, they could work more effectively with the R&D organization.

In addition, due to a better understanding of costs, marketing managers also could be held more accountable—not just for sales, but for the profits of each brand. This, in turn, led the company to develop a more clearly defined business strategy, which has helped the R&D organization define the long-term R&D needs of the company.

Finally, within a beverage company the accounting organization has established excellent systems for tracking new product developments. Specifically, accounting information is presented in a format that can be easily used in tracking specific R&D projects—and in tracking specific new product developments. This information is also presented in a timely fashion so that decisions could be made with regard to the use of resources for R&D or new product developments before it is too late.

**MANAGING RESOURCES AND MAINTAINING AN INNOVATIVE CLIMATE**

Even if a company as a whole is managed effectively, of course, challenges do not cease. Resources are not limitless within any company. Moreover, even though the managers in a company may agree on how to work
together, they still have different ideas about the direction in which the company should go. Because of this, they want to use the resources of the company in different ways.

Furthermore, even if a company as a whole is managed effectively, the challenge of continuing to be innovative always remains. To be really innovative, a company needs to not just rest on its laurels. Instead it has to continue to surpass what it has done in the past. Maintaining such a climate indefinitely requires great resourcefulness and imagination.

There are no practices or systems that will automatically make a company deal with these challenges effectively. What will help is a certain mentality—one that constantly inquires about whether the resources that are being used are being managed as effectively as they could be and one that constantly seeks to find ways to maintain an innovative climate. Such a mentality can best be fostered by focusing on the company as a whole, and the general manager is usually the only person in the organization who can rise above whatever his or her particular background is and foster such an innovative climate.

In food-processing and beverage companies—as in most kinds of companies—such a general manager is relatively rare. Most general managers in food-processing and beverage companies—as in most kinds of companies—focus on marketing and, to a lesser extent, finance. There are, however, examples of general managers in food-processing and beverage companies who do not function like this. For example, the general manager of one food-processing company takes as active an interest in manufacturing and R&D as he does in marketing. He believes that to grow the company’s businesses, he needs to be as interested in finding better ways of cutting costs and of making technical advances as he is in expanding markets.

The general manager of another food-processing company also takes an active interest in R&D. This general manager pushes the R&D organization to be more productive because he believes that R&D is a vital resource, and unlike most general managers in food-processing and beverage companies, he does not hold to the theory that R&D spending should be limited to a specific percentage of sales.

In sum, to manage resources effectively and to maintain an innovative climate requires a certain mentality—not a set of practices to be followed. This mentality involves viewing a company as a whole—and in then being willing for the company as a whole to continually face the challenges of managing resources and of maintaining an innovative climate.

**CONCLUSION**

Perhaps the world-class practices of R&D management in food and beverage companies are not as sophisticated as world-class practices of R&D management in other kinds of companies, but they are, nonetheless, world-class practices. Managing R&D in food-processing and beverage companies,
in which R&D, in general, is not valued as highly as it should be, is difficult. Given the dominance of the marketing organization in most food and beverage companies, this is unlikely to change for quite a while. Still there are ways of overcoming many of these difficulties.

The first step involves improving how R&D is managed within the R&D organization. This lays the basis for improving the coordination of R&D with the rest of the company. Better coordination then lays the basis for improving how the company as a whole is managed. This, in turn, means that new challenges must be faced, such as managing resources effectively and maintaining an innovative climate.

Realistically, most R&D organizations in food-processing and beverage companies will not reach the highest level—that of managing resources effectively and maintaining an innovative climate. Many of these improvements are outside of what R&D organizations by themselves are able to do. Nonetheless, improvements can be made, particularly in the management of R&D and in the coordination of R&D with the rest of the company. Moreover, there is still a lot that could be done in many food-processing and beverage R&D organizations to improve the management of R&D.

Note
The 38 food-processing and beverage companies are: American Home Foods; American Maize-Products; Anheiser-Busch; Armour/Swift-Eckrich; Best Foods; Brown-Forman; Campbell Soup; Continental Baking; Coca-Cola; Coors; Dean Foods; Del Monte; Dr. Pepper/Seven Up; General Mills; Gerber; Gilroy Foods; Heinz; Hershey Foods; Heublein; Hunt-Wesson; Kellogg; Kentucky Fried Chicken; Kraft; Land O’Lakes; Lipton; M&M/Mars; McCormick; Miller Brewing; Nabisco Brands; Nestle; Ocean Spray; Pillsbury; Quaker Oats; Rich Products; Sara Lee; Seagram; and Tropicana.