

## SEEKING OPPORTUNITIES IN THE MEAT INDUSTRY THROUGH SCIENCE AND TECHNOLOGY

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*Cargill Meat Sector*

It is a pleasure to be here today as a keynote speaker for the International Congress on Meat Science and Technology.

As you know, the theme of this year's meeting is "Meat fortifies the quality of life". My contention is that this fact - meat fortifies the quality of life - offers our industry many opportunities. It also presents a wide range of challenges, which I believe can be met through advances in technology and science. Strong science and strong technology will help the meat industry remain competitive. And the 40th International Congress on Meat Science and Technology will furnish new insights and new inspirations that will help lead to a successful future.

Let me preface my remarks by giving you a glimpse of Cargill's perspective on things. Over the long-run, we at Cargill are optimistic about what will happen. Our view of the world can be best illustrated by the story of two salesman who were sent to an undeveloped nation to sell shoes. The first shoe salesman arrived and, much to his dismay, saw that all of his potential customers were barefoot. He wired a message home that said, "No market, everyone goes barefoot". The second salesman arrives in the same village a short time later. He rushed to send his own wire home. His wire said: "Quick, send shoes, 5 million barefoot, everyone needs shoes!".

At Cargill, we tend to be like the second salesman. We try to see opportunity where others do not. And I truly believe there will be opportunities for our industries - especially if the meat industry works in conjunction with science and technology.

I must admit that I am probably one of the few people at this important gathering who does not have a technical degree. Mine was in history, and because of that, I would like to reflect a little on the meat industry over the last 40 years. I think this is appropriate since this is the 40th annualgathering of the International Congress. And on Friday, there will be a special session to discuss the lessons of the past.

In looking back, I can say some things really never change. The basics of the slaughter process, for example, are the same today as yesterday. In other words, we still have to bleed the animal, take off its hide or feathers, eviscerate it. What has changed is how we accomplish those basic tasks, and science and technology have helped make those jobs safer, easier, and more productive.

Probably the main change in the last 40 years - at least in the United States - is the rapid conversion from the shipment of hanging carcasses to the shipment of boxed beef. For those of you who are not familiar with this, boxed beef involves taking the larger cuts from the chuck, rib, loin and round area, and then packaging them in vacuum sealed bags and shipping them in a box. Hence, the name boxed beef.

Boxed beef is one of the biggest success stories in the history of the beef industry, and science and technology played key roles. Prior to 1960, virtually all the beef received by grocery stores in the United States was in the form of hanging carcasses. That meant that we were shipping bone and fat that the grocer could not use. With boxes, the grocer orders the cuts he or she wants - without all the waste.

The demand for boxed beef grew quickly. In 1972, 38 percent of the beef received in major supermarket chain stores was received in boxed form. In 1976, it was 70 percent boxed and today virtually all boxed. Firms that did not exist 40 years ago have become giants in the US meat business. These firms saw a trend. They saw how boxed beef could lower freight costs, lower labour costs, improve quality and improve merchandising.

There are lessons to learn from this bit of history. One lesson is that we must constantly strive to be innovative in ways that serve our customers better. Science and technology helped the boxed beef revolution in many ways, not just the packaging machinery, but also through new packaging materials, shelf life studies, and new ways to monitor bacteria.

Indeed, if we are innovative, we will be rewarded, as Cargill has found out over the years. At this point, I would like to tell you a little more about Cargill, because you have to understand Cargill to understand our outlook.

In short, Cargill is a privately held merchandiser, processor, transporter and warehouse of agricultural and other bulk commodities. Those are skills that have been refined since the company was founded in 1865. We have about 70,000 employees in 58 countries worldwide.

I am president of the Meat Sector, which is one of five product-line sectors at Cargill. While Cargill is still thought of as being a grain trading company, less than 20 percent of its business now comes from that area. Today, we have an Industrial Sector, which includes steel, salt and fertilizer production. There is also the Trading Sector, which encompasses financial instruments as well as grain.

To be sure, Cargill is still actively involved in agricultural commodities. In addition to the Meat Sector, Cargill has an Agricultural Sector, which includes feed, seed and cattle feeding, among other business. And in the Food Sector, we have divisions like corn and flour milling and oilseeds processing. I began my career with Cargill in oilseeds and then moved to flour milling before going to the Meat Sector.

The Meat Sector includes beef, pork, chicken and turkey processing both in the United States and abroad. We not only have beef plants in the United States, but also Canada, Mexico and Australia, as well. In addition to US plants, we have a pork facility in Taiwan and poultry operations in the United Kingdom, France, Honduras and Thailand. I also should mention that we have a successful liquid egg processing business in the United States.

Cargill's Chairman is Whitney MacMillan. He asked me to tell you that he wishes he could be here today, but was prevented from doing so by a long-standing commitment. If he were here, Whitney would tell you Cargill's vision is this:

We will be the best in business that are essential to improving the standard of living of the five billion people in the world - the buying, storing, trading, processing, transporting, distributing, and marketing commodities, especially agricultural raw materials and products.

To expound a little further, we believe this vision will enable the corporation to grow, create wealth, and contribute to the well-being of all those we are privileged to serve. You see, it is our belief that private enterprise and improved standards of living are not mutually exclusive terms. Far from it. They go hand in hand in a modern world.

The human condition improves only when wealth is generated. And economic growth will occur only when people are fed adequately. People cannot create wealth on empty stomachs or malnourished backs.

Cargill is in competition with others for the right to serve the needs of customers worldwide. That competition will make us leaner and more efficient. And as a result, the process will make sure we serve global food needs more efficiently and more cost effectively than any time in history. It will assure that people have better access to more reasonably priced food than ever before, whether they are in the affluent developed world or the needy developing world. And this offers us opportunity.

Since our beginnings, we have helped feed the world by finding, storing and transporting the basic agricultural commodities from where they were raised to where they were needed.

As the needs of our customers have changed over the years, we have changed with them. Initially, our customers needed basic commodities, and we provided them. Over the years, a local marketplace became a national one. And lately an international market. We grew in tandem to meet the expanding circle of customers. More and more, customers needed commodities in different forms - flour rather than wheat, oil and meat rather than beans. We provided for those changing needs by developing our ability to add value to the commodities we handle.

Meat and poultry are excellent examples of how we add value. Cargill has gone from being just a grain company to one that adds value to the grain by making feed. We have then gone a step further by then processing the livestock that ate the feed. And we have adapted to the needs of our customers. Instead of selling beef by the swinging carcass, we offer our customers boxed beef.

In the process of adding value, the meat and poultry industries are making good use of resources. While some environmentalists might disagree, I think livestock are politically and environmentally correct. Cattle are a good example. They are able to convert forage and roughage - not useful as foods for humans - into highly nutritious foods. Eighty to eighty-five percent of nutrients that US cattle consume, come from sources not edible by humans. In turn, cattle offer a nutrient dense food that helps meet requirements for protein, vitamin B-12, iron and zinc. Even in today's society, concerned about fat, beef is a recommended part of balanced diets.

By adding value to meat and poultry, we are helping deliver products that I truly believe fortify the world. Think of what happens in many countries around the world that are experiencing an expanding economy. One way people chose to improve their quality of life is by eating more meat. While domestic consumption of beef has stabilized in recent years, total production has risen in part because we are exporting more and more beef to countries with expanding economies.

As you probably can tell by now, Cargill takes a global view. Our strategy is built upon global expectations. At Cargill, our model for the future - and our business strategy - follows an optimistic scenario and we see many opportunities.

By the middle of the next century we will see a world populated by ten billion people or so - approximately double our current global population. I know that the exact number is much in debate, but it is safe to say there will be more people on the earth in the future than today. Whatever the population number is, we anticipate continued global economic growth and higher standards of living for larger numbers of people worldwide.

We also forecast a significant shift in the world trading picture essential to accommodating these trends. Rice production will be unable to keep pace with demand from those still dependent on starch diets and thus will have to be offset by increased wheat production. But at the same time, rising standards of living among a larger segment of the population will fuel significantly stronger demand for protein. Animal numbers will increase, while cereal acreage worldwide remains static, in large part due to rising demands for natural resource protection.

These projected trends have significant implications. They suggest an active international commodity trading environment into the next century, as growing demand for food grains spurs increased reliance on trade. These trends emphasize the importance of technologically advanced and environmentally benign agricultural inputs, such as seeds and fertilizers.

These trends also project sharp increases in meat production globally to serve accelerating demand. A Food and Agricultural Organization analysis suggests that red meat production by the year 2025 will double worldwide from levels in the late 1980's. Pork production will triple, and poultry production will increase fivefold. In other words, we see a world with nearly twice as many people whose cereal needs will be three times current global production.

Let me dwell on this point a little more. What I am saying is that I see an optimistic scenario for the meat business as the world population grows exponentially. That is because I believe your efforts and my efforts to fortify the quality of life will help improve standards of living around the world. This in turn will spark additional demand for meat.

Which meat will lead the way? By the turn of the century, pork probably will still be the number one meat around the world in terms of quantity produced. Poultry, currently the number three meat, is on track to be the number two meat by the year 2000. Whether world poultry production will ever be capable of overcoming pork production will depend on a number of long-term developments and trends.

Genetic improvements in pigs, as in poultry, are making pork production more efficient and more acceptable to consumers. For beef to remain competitive, that industry must continue to learn more about refining its products so they meet consumer perceptions and demands.

In many ways, I think that consumer perceptions pose as big a challenge as trade barriers, farm policies or other tangible market factors. It is how consumers view our product that seems to be important.

And what is on the minds of consumers? Nutrition remains the top priority for consumers in the United States. One survey says 62 percent of all shoppers say they are very concerned about nutritional content. Three out of five of these shoppers say they are concerned about fat and consider it a threat to their health. This helps explain why beef consumption has reached a plateau, while poultry has gained.

In addition to nutrition, consumers are seeking convenience. Convenience is not just a hallmark of today's individual customers. Our food service and institutional customers want products that are easier to use and can be handled more efficiently. Where we do not compete with other customers, we now are involved in cutting steaks or cooking roast beef in centralized locations. The pattern is the same in our pork and poultry operations.

Food safety is another factor affecting consumer perception. It is one that has been in the headlines of newspapers and on the screens of televisions a good deal in recent years. Seventy percent of all adult consumers rank food safety as an important part of their food-buying strategies.

All this boils down to the fact that the industry continues to go through many changes. The Kiplinger organization is a US research firm that looks at many areas of the economy. One of Kiplinger's recent surveys says that consumer demands are forcing a re-engineering of food products. Consumers are demanding products to better suit changing preferences for faster, safer and healthier diets. The industry, science and technology are responding to those changing needs. At Cargill, for example, we have recently formed a Specialty Plants Products Department to work across divisional lines to coordinate increasing customer demands for specialty grains and products - many made possible by biotechnological breakthroughs.

Special attributes - the Kiplinger people write - will be rewarded. These attributes include lean meats and products with low cholesterol or fat content. There are, of course, a range of other possibilities.

So, what does all of this mean to those of us here today. I fully believe that our industry would not be where it is today if we were incapable of dealing with challenge. Steady advances in technology and science will help us meet these challenges in the years ahead and allow our industry to continue fortifying the quality of life.

Let me give you a few examples of what I mean:

Look at the concerns about diet and fitness. As I have said and you well know, chicken and turkey have made great gains among consumers. They are perceived to be healthy meats. Even pork is labeling itself as the other white meat. But, while some of the gains in poultry and turkey have come at the expense of beef, the red meat industry is addressing the issues of fat quite well.

Today, the standard in the US industry is no more than a quarter-inch of fat cover on carcasses, down from more than a half inch a decade ago. While trimming is a primary tool for achieving this standard nowadays, we are trying to use science to keep the fat off in the first place. This comes from looking at the genetics of different breeds as well as the genetics of the feed ingredients we use.

We also are trying to improve the information we are providing producers - market signals we pass along in the marketing chain. At one of our beef plants we are testing a scanner that can give a better estimate of the total red meat yield of a carcass than the human eye. One perfected, this will be a tool to help us award premiums to producers who deliver raw commodities suited to new consumer tastes. It will be one of many tools reshaping agriculture.

Although perceptions on fitness remain important, I would suspect that there will be a good deal of talk at this gathering about food safety. I can attest that in the states this has been THE issue for the meat industry. While the e. coli outbreak over a year ago did not start the debate, it elevated it to a higher level. Unfortunately, the food safety debate is not always guided by science. More often than not, emotion and hidden agendas work their way into the discussion. A prime example is the US government's policy called zero tolerance for faecal contamination and ingesta on beef carcasses. Zero tolerance has been in effect since March 1993 and it calls for packers to trim even the smallest speck suspected of being contamination.

The problem is that all this trimming actually is increasing bacteria on beef carcasses. That seems to be because the carcasses are handled more than before. A survey of 15 major US beef packers shows that in the year since zero tolerance went into effect, 73 percent of the plants reported increases in total coliform bacteria counts on beef carcasses. In effect, this policy of zero tolerance is failing to deliver consumers safer beef. At the same time, the policy is asking producers, packers, retailers and consumers to bear the burden because that trimmed material is lost from production forever.

We would like to use warm water washes as an additional tool to remove suspected specks of faecal contamination. Obviously, if there is a huge smear of contamination on a carcass, that area should be trimmed. But for small flecks that may not even be obvious, we think warm water washes should be allowed. Now, warm water washes do not fall into the category of rocket science. But the science showing that washes can work has been known for many, many years. Getting government approval to do that has been difficult. This is in part because emotions are ruling the day, not science and technology.

Relationships between a government and industry are not always positive. Close cooperation between industry and science and technology is a pre-requisite to the right communication between industry and the government. We must argue our case with science and facts, not emotion.

I think the meat industry knows what it is doing and it knows how to do things right. In the United States, packers are already doing more than the government requires. Many packers are using processes to prevent hazards. At our plants, we employ a system called HACCP (hass IP) -Hazard Analysis Critical Control Points.

HACCP is simply a tool that provides a systematic approach to the production of safe, wholesome and properly-labeled food. Our HACCP systems are designed to control three main hazards: physical objects, chemical residues and microbiological risks.

HACCP can be described as having seven steps:

1. Creation of a flow chart of the production process.
2. Identification of hazards and assessment of severity of these hazards and their risks.
3. Determination of critical control points at which an operation is under control at the particular critical control point.
5. Establishment and implementation of procedures to monitor each critical control point to check that it is under control.
6. Taking whatever corrective action is necessary when monitoring results indicate that a particular critical point is not under control.
7. Verification to ensure the HACCP system is working properly.

Here is an example of how HACCP works: One potential hazard in the production of ground beef is the presence of bits of metal that can break off from machinery. One critical control point is established at packaging using a metal detector. If metal is detected by the machine, production is stopped and a search is taken to find the metal and identify where it came from. Metal detectors are checked periodically during the day using metal standards to ensure they are working properly. Records are kept for monitoring, verifying and taking corrective actions.

HACCP fits in well with our Total Quality Management approach. And it also will work well as more of our businesses seek ISO (I-so) quality certification. Just a few years ago our Gerkens Cocoa in Wormer, The Netherlands became the first Cargill business, and I believe, the first cocoa factory worldwide to receive ISO certification. Since then, other Cargill businesses overseas have received this certification. In the United States, a number of other Cargill businesses are preparing for this certification, including one of our pork-processing plants.

The US government has been talking about making HACCP mandatory, but again the emotional debate is causing progress to be slow. But even though we are not required to use HACCP, we will do so because it works.

Also, while packers are not required to do so, many are using microbiological testing as a scientific tool to monitor the general sanitation of the plants. At our facilities, this routine testing gives us an objective look at how clean our operations are. We can put this information on a graph and if a certain area of the plant is showing an increase in bacteria, we can investigate and take corrective action before a minor problem becomes a major problem. At present, microbiological testing cannot be used as a front line monitoring tool in a HACCP system because the results of the tests take up to two days to obtain. However, testing is an important tool to validate the effectiveness of a control.

We need more advances in microbiological testing procedures. Yes, there are rapid tests now available for e. coli. The problem is that it still takes a while to culture the bacteria to the point that you can use the rapid test. And one of my concerns is the perception in some camps that we will be able to use microbial testing as a pass/fail measure on every steak or every chicken wing.

Which brings us to the issue of irradiation. In many countries outside the United States, irradiation is not an issue and the process is readily use on products. But we have a handful of loud activists in my country who are convinced that if you eat too much irradiated chicken, you will turn into a walking nuclear waste dump. While consumer surveys in the states show that the majority of people would not mind eating irradiated food if it helped kill bacteria, widespread adoption of the technology will be slow coming for two reasons. First, it has not been approved by our Agriculture Department for beef. Second, the technology is not advanced so that it is practical for in-plant use. I believe there is one facility in the United States that now irradiates foods, and it is in Florida.

Until the technology has reached the stage that it can be used within the processing plant, I personally doubt that irradiation will be used much in the next few years. I think that within five years, irradiation will have advanced to the point that it can be used in plants. Within 10 years, ion pasteurization should be readily available. We think this process is attractive because no chemical residues or radioactivity remain in the food. Plus, it does not destroy the bacteria that warn of food spoilage. But even ion pasteurization is not a silver bullet. Consumers still will have to play a role in food safety. You can provide a totally clean product, but if you do not handle it right it will be even more ripe for cross contamination. In the states, we try to stress the need for food safety from the farm to the fork. Too often that message is misconstrued to mean that we want the consumer to assume the burden of food safety. In reality, it is clear that we all must share the burden.

So, our industry faces many challenges, especially in the area of meeting consumer expectations. But over the long-run, we at Cargill are optimistic about what will happen. As you will recall, Cargill tends to be like that second shoe salesman - the one who saw excellent opportunities where another saw none. It will be new technology and science that will enable our industry in fortifying the quality of life in the years ahead. The meat industry must embrace this fact and take every step it can to assure that strong science and technology are used. This conference is another step in that direction. I thank you for inviting me to speak and I look forward to visiting with you in the coming days.