ARTICLE

Risk Communication – Consumers Between Information and Irritation

ORTWIN RENN

Institut fur Soziakwissenschaften, University of Stuttgart, Germany

ABSTRACT Health risks are front-page news. Be it BSE, surface ozone or radiation from transmitter stations or mobile phones, the popular press puts out a constant stream of risk warnings and sensational reports about potential health threats. This article looks at how the general public perceives and assesses such information when it comes to food risks. In the first part, the elements of food risks are discussed and then compared with the perceptions of these risks. The last part of the paper deals with the consequences of risk assessments and risk perceptions for risk management and risk communication.

KEY WORDS: Risk perception, consumer preferences, risk communication

Introduction

How do consumers perceive the risks involved with food, and how do they cope with the real and alleged scandals in the food industry? How does their perception influence their behaviour? These questions deserve careful attention as many public campaigns on nutrition mean well, but frequently have the opposite effect. The German economist Hans Evers once said the opposite of good is well meant. In order to be good and effective at communication it is important to take a close look at the psychology of risk perception as well as the social factors governing eating behaviour.
Before looking more closely to the world of perception, some basic considerations on risk should be made. Much of what we know about the perception of nutritional issues is known from observing and experiencing risk behaviour. In this process three components of taking risks play a decisive role: the complexity of the issue at hand, the uncertainty about the actual occurrence of the presumed effects and the ambiguity when these effects are assessed by oneself and others (Klinke and Renn, 2002; IRGC, 2005). This paper will come back to this issue later.

These three components have a direct influence on how risks are normally dealt with in science and politics. Here all three components — complexity, uncertainty and ambiguity — must be applied in parallel to all stages of the risk regulation process. The issues of these stages are (Kolluru, 1995):

- How high is the risk? This is an issue concerning scientific risk assessment.
- How acceptable is the assessed risk? Is it tolerable or not. This concerns risk evaluation.
- What possibilities are there to further reduce a risk rated as being unacceptable and, if possible, to avoid or minimize it. This concerns risk management.
- How are transparency, understanding, and if at all possible, agreement to the planned risk management achieved? This concerns risk communication.

These are the four classical stages of any risk analysis which must also be considered when food safety is addressed. The focus here will be on risk communication, but this work would not be complete without the scientific aspect, i.e. the assessment of the level of risk, and the political aspect, i.e. the assessment and determination of measures for reducing or minimizing risk (risk management).

Scientific Risk Assessment: The Challenges of Complexity, Uncertainty and Ambiguity

Scientific risk assessment is the first step: But what really are the scientific characteristics of risks, above all in the field of nutrition? Here, the three aspects of complexity, uncertainty and ambiguity are important (more details in IRGC, 2005; Renn, 2004a). First complexity: Complexity is not the same as complicatedness. The world is always complicated — “complex” means that many interfering factors are at work between cause and effect, which either reinforce or weaken this relationship, so that it is not necessarily possible to deduce from the observed effect which cause(s) is(are) responsible. In the field of nutrition conditions are particularly complex. One cannot take a look at intestinal cancer and see what caused it. Doctors depend on model calculations which frequently have only hypothetical validity. In many cases, too, even experts disagree on the validity of these models. It is this controversy itself which presents a problem of
communication. It is not particularly difficult to communicate simple cause-effect relationships, but in the case of controversial or less than clear causal conditions any communication means toying with the hornets’ nest of speculation.

The second important element of any scientific risk assessment is the degree of uncertainty. All toxicological examinations are based on the fact that deterministic, i.e. fixed cause-effect chains are rare when it comes to nutritional health hazards. Identical or similar exposures can cause a wide variety of highly differing reactions in different individuals. This applies to the entire organism down to the molecular level. In many aspects of health risks we depend on the recording of stochastic relationships. Harm can only be predicted with a certain probability. Above all this applies to carcinogenesis: theoretically one single molecule can trigger cancer. At best we can indicate the probabilities of a malignant affection. With respect to communication stochastic relationships offer great challenges: everyone knows at least one overweight person over ninety years old and in great health. Or someone has a 90-year-old grandfather who has smoked cigarettes all his life. This is a wonderful excuse to smoke or be overweight. It is difficult to relate probabilities, but we must face up to this task.

Then there is the third component, ambiguity. This means that one and the same identical behaviour or statement will be assessed entirely differently by different groups. Ambiguity differs greatly from uncertainty, even though both terms are frequently confused. Let us take green genetic engineering in the field of foodstuffs (Tait, 2001; Levidow and Marris, 2001). There are few who maintain eating these foods would cause serious illness. Furthermore there is little uncertainty about the health effects from a diet based on genetically modified plants. However, it is fiercely disputed whether genetically altered food is necessary, whether it meets a social need, whether it would encourage man’s hubris to model everything as he/she sees fit, whether genetically engineered food fits into one’s own idea of life or the world, in short whether this kind of foodstuff should be rejected for social or ethical reasons. Opinions do indeed differ greatly on these issues. People have different visions of the world and the future. These visions include strong beliefs about the necessity or reasonableness of taking or rejecting specific risks. To communicate about ambiguities is not easy either, as in such a controversy each side is convinced to have the truth on its side and watches any balanced coverage — if this is possible at all — with utter distrust. In conflicts of ambiguity there is generally only a polar differentiation into we and the others. And the others are our enemies, of course.

Conclusion

What makes communication in the field of nutrition so difficult and also adversely affects the effectiveness of this communication are the three factors combined: complexity, uncertainty and ambiguity. First of all, science does
not provide us with an unambiguous relationship between what we eat and from what we subsequently suffer. Secondly, we must live with the uncertainty that the assumed effects on individuals and collectives vary greatly. Thirdly, there are differing social assessments of the same factual situation, both with respect to individual diets as well as their effects on one’s health and sense of well-being.

A New Class of Risk: Systemic Risks

High complexity, uncertainty and ambiguity characterize a class of risk designated as systemic by the OECD (2003). This risk class also — but not exclusively — presents a compelling point of interest in the field of foodstuffs — the keyword is BSE. The OECD founded a new working group to deal with systemic risks.

Using BSE as an example, the typical attributes of systemic risks will be described here briefly, referring to the risk of BSE (Dressel, 2001). Based on European Mortality Statistics it is known that approx. 130 persons died from the new version of the Creutzfeldt-Jakob or related diseases in Europe in the past 25 years. This represents not even 10 percent of those who died from salmonella poisoning in the same period. And — interestingly enough — the number of 130 deaths is almost precisely the number of persons who died due to the inadvertent consumption of perfumed lamp oil in Europe in the past 25 years. Generally, the victims of lamp oil poisoning are small children and infants. But who has ever seen anything written, let alone being discussed about the victims of lamp oil?

The point I would like to make is not to dismiss the BSE crisis as hysteria. Society was rightly agitated for many good reasons. The point is that certain risks have such a great symbolic power, that even with light or relatively light physical harm they exert a strong influence on other fields of life such as the financial world, the trade balance, consumer psychology, politics, faith in the system as a whole and on other important social and cultural factors. For example, the fact that vegetarian cows were fed meat contributed much more to this symbolic assessment than the mortality statistics of the human victims. The symbolic aspect of this issue cannot be ignored, as it is a fundamental element of the way risks are treated in our society.

In order to better understand the symbolic power of risks, a close look must be taken at how information on risks is intuitively perceived and evaluated by the population. This will be done in the next section: risk perception.

The Basic Patterns of Risk Perception: Fight, Flight, Play Dead and Experiment

How do consumers perceive nutritional risks? First of all it is highly important to know that our behavior is primarily driven by perception and
not by facts or by scientific assertions of what is understood as facts by risk analysts and scientists. Every consumer links certain expectations, ideas, hopes, fears and emotions with products which only in part coincide with the findings of nutritionists or even with the contents of advertisements. Hence it is imperative to take a close look at these perceptions.

Perception patterns have been researched thoroughly in psychology and social psychology (Slovic, 1987; Boholm, 1998; Sjöberg, 1999; Rohrmann and Renn, 2000, in relation to food, Sparks and Shepard, 1994; Fife-Shaw and Row, 1996; Hansen et al., 2003). People do not use completely irrational strategies to assess information, but most of the time follow relatively consistent patterns of perception. These patterns are related to certain evolutionary bases of hazard deterrence. In dangerous situations humans react with four basic strategies: flight, fight, play dead and if appropriate, experimentation (on the basis of trial and error). This reaction pattern can be visualized by imagining how our ancestors came upon a predator in the wilderness. In this situation of acute threat such as coming up against a tiger, the threatened did not have time — it would not have made a lot of sense to make a probability analysis, as to whether the tiger may still be hungry or not. In this moment threatened people had only three possibilities, namely either to flee and hope to be faster than the tiger, secondly to believe in their strength and fight, or thirdly to play dead, believing the tiger could maybe be tricked. The last option, namely experimentation, unfortunately is only the tiger’s in this case.

In the course of cultural evolution these basic patterns of perception were increasingly enriched with cultural patterns. These cultural patterns can be described by so-called qualitative characteristics. They describe properties of risks or risky situations based on which people judge risks, namely beyond the two classical factors of risk analysis, i.e. level of probability and degree of possible harm. Here psychologists differentiate two classes of qualitative perception patterns: on the one hand risk-related patterns, which are based on the properties of the source of risk; on the other hand situation-related patterns, based on the idiosyncrasies of the risky situation (Renn, 2004b).

One example of a risk-related pattern is the perceived “dread” of the consequences of a possible harmful event. If for example you are riding in a car and thinking about possible accidents, you are always under the impression you would with high probability get away unscathed in a car accident (“fender-bender mentality”). However, if you are sitting in an airplane you are under the impression that if something happens here there is no getting away. This feeling of apprehensiveness does not subside even when you know and are convinced that statistically many more people die in car accidents than in airplane crashes. The feeling of helplessness triggers fear, as it no longer permits the typical reaction patterns of flight, fight or playing dead as sensible strategies of hazard deference.

We can deal with dangers better when we are well aware of them and when we can prepare ourselves for them. Seen from an evolutionary
point-of-view this also makes a lot of sense. After all, the known and familiar risk is much less fearful than the unknown and less familiar risk. This has a special impact on the field of food. A good example is the perception of naturalness. Anything which is seen as natural is considered familiar and thus less dangerous. Anything which is seen as chemical or artificial is considered foreign, unnatural and thus dangerous. A side-effect of modernization, ever-increasing parts of society are under the impression that everything which is provided by nature is inherently benign, favourable and healthy; whereas everything “chemistry” does to our food is unnatural, highly risky and unhealthy. This dualism does of course not withstand scientific examination. Beneath it, however, lies the longing of modern humankind for simple, unambiguous conditions, and for a clear polarity of good and bad, safe and dangerous. Naturalness is rated so highly nowadays as “nature” is not suspected of an ideology. Those who do something for nature and intend to preserve the natural order are inherently altruistic. To what extent this dualism of nature and chemistry is already prevalent in everyday life can be seen by the change in meaning of the words “synthetic” or “artificial”. Things natural are “in”, things synthetic or artificial are “out”. It is not without reason that all large food companies advertise with “natural” on their labels, regardless of how justified this may be.

Situation-related patterns of perception include aspects such as voluntariness and the ability of self-control. If a person is of the opinion that s/he can control the risk, then s/he will perceive it as less serious. This mode of thinking frequently takes effect where eating habits are concerned. People believe to be able to easily do without sweets, alcohol or other food considered unhealthy, if only they wanted to. However, mostly harmless chemical food additives are perceived as a threat to one’s health. Empirical studies have demonstrated that nearly 90% of the variance in risk perception with respect to perceived food risks could be explained by three qualitative patterns: perceived severity (in particular dread), familiarity, and number of people exposed (Sparks and Shepherd, 1994).

**Mental Filing Cabinet of Risk Perception**

If these qualitative characteristics are considered together, they can be sorted into only a few consistent risk perception classes. In literature they are also called semantic risk patterns (Streffer et al., 2003). The following patterns were examined particularly thoroughly:

- Risks posing an immediate threat
- Risks dealt as a blow of fate
- Risks presenting a challenge to one’s own strength
- Risk as a gamble, and
- Risks as an early indication of insidious danger

These patterns have functions similar to drawers in a file cabinet. When faced with a new risk or when obtaining new information about a risk, most
people try to file this new information into one of the existing drawers. The “drawers” will not be treated in detail here, that would exceed the scope of this paper (more information in: Renn, 1997). The pattern however, especially relevant for food, will be dealt with. It comprises risks perceived as early indicators of insidious dangers.

Within the framework of this risk pattern people rightly assume that scientific studies can discover insidious dangers early and that they can reveal causal relationships between activities or events and their latent effects. Examples of application for this type of risk can be found in the perception of low doses of radiation, electromagnetic fields (from mobile phones and antennas) food additives, chemical preservatives or genetic manipulations of plants and animals. The perception of these risks is closely linked with the need to find clear causes for seemingly unexplicable effects (e.g. cancers in children, allergies etc.). In contrast to the technical-medical understanding of risk the probability of such an event is not interpreted as a significant deviation from the naturally given variation of such events (i.e. no longer explainable by coincidence), but as the degree of certainty by which a singular event can be traced back to an external cause.

Knowledge of the possibility of cancers caused by certain food additives or pesticide residues does at least legitimise the suspicion that any cancer can be explained by the consumption of certain foods. A person with cancer or one who must watch how a family member or one of their friends suffers from this disease, will look for an explanation. In this secularised world metaphysical explanation patterns are no longer valid. At the same time, the best explanation pattern - a random distribution of cancer diseases according to the current state of knowledge — does little to satisfy the mental need for an explanation that “makes sense”. How dismal it is to be the random victim of a blind disease distribution mechanism. However, does one know a concrete reason, such as environmental pollution, unhealthy diet, or inadvertent contamination of food with residues etc., then the occurrence of disease makes at least sense in a subjective way. If, moreover, oneself cannot be put at fault subjectively (through smoking or alcohol abuse) and something else can be blamed for causing the disease, then the disease may even fulfil a social purpose, namely to alarm future potential victims and to fight against the cause of the evil. This effect is amplified by the tendency of people to focus on the hazard, the potential for harm, and ignore or downplay exposure. Kraus et al. (1992), for example, discovered in their empirical study on intuitive toxicology that people underestimate uncertainties and tend to ignore exposure when they are informed about a potential causal relationship between an agent and an effect.

The often highly emotional discussion of risks of this type must be seen against this psychological background. The human ability to sympathize frequently makes people identify with the victim. Risk analyses proving the probability of an insidious disease as the result of an emission leads to identification with the victim affected by the risk. Whereas risk analysts use stochastic theories in order to characterize the relative hazard of events,
theories which do not permit causal relationships between singular triggering events and their consequences (thus allowing only probabilistic attributions of causality), laymen find in them proof of the blameworthy involvement of social actors in the causing of life-threatening diseases.

Where risks as an early indication are concerned, affected groups depend on information provided by third parties. As a rule these risks cannot be perceived with the human senses. Moreover, these risks are highly complex, i.e. there are usually many years of latency between emission and effect. When we drink water containing pesticide residues health symptoms may occur only many years later, if at all.

If laypeople assess these risks they sooner or later come across a key question: Do I trust the institutions providing the necessary information, or do I not? If the answer is yes, I am willing to use a balancing approach between risks and benefits and to assign trade-offs between the two. If the answer is -no-, I want zero risk. For if one is dependent on information provided by third parties for the assessment of such risks and these third parties are not considered trustworthy, then one does not accept any cost-benefit calculation. Then zero exposure will be demanded. The wish for zero risk in the case of lacking confidence is a global phenomenon. A good example is the so-called Delaney Clause, a food regulation effective for the US Food and Drug Administration, an amendment to the law initiated by Senator Delaney. The amendment says that all potentially carcinogenic substances which could occur in food are principally forbidden. This is regardless of the concentration or exposure. No risk calculations are considered (at least in theory), since it is not a question of tolerable risks, but of the existence of a hazardous property. Regardless of the level of the risk, substances that have the specific hazardous characteristic such as being able to cause cancer are principally forbidden. This is asking for zero risk. Such a claim cannot be carried through in practice, even in the USA the Delaney Clause has again and again been undermined. The fact that it is with food of all things where such tough action has been prescribed clearly shows how universally effective this pattern of risk as early indication is and that this is so the world over.

Examples of Genetically Modified Organisms (GMOs)

This perception mechanism with risks as early indication is for example a central problem of genetically modified organism in agriculture and food. All our surveys clearly show that those institutions which nowadays want to advance green genetic engineering meet with lacking faith on the part of consumers (Zwick and Renn, 2002). Under these circumstances consumers say: Regardless of how high the risk may be, if we no longer have the faith and cannot assess the hazard on our own, then we demand zero risk. This example shows how little helpful it is to present risk comparisons in this case. Of course, the same people who demand zero risk in genetic engineering will ride a bicycle, drive a car or get on an airplane. They
don’t perceive this as inconsistent, as these means of transportation are part of a different risk pattern, where the trade-off between benefit and risk are considered legitimate.

Genetic engineering is a textbook example of the perception of risks as early indicators. Only few people are of the opinion “If I eat genetically altered tomatoes I will drop dead.” Neither is it the fear of health risks which is the decisive component in the rejection of genetically altered organisms (Grove-White et al., 1997). This is why so many information campaigns explaining the complete harmlessness of GMOs with respect to health impacts are entirely ineffective. These campaigns lead a war of rational arguments against a front which doesn’t exist. The worries of GMOs opponents are concerned with long-term effects, they are sceptical as to the social benefit, they suspect greed for profit at the expense of nature or the general public and worry about the concentration of power in large industrial concerns (Hampel et al., 2000).

Several years ago a European Panel on the subject of Novel Food was carried out in five different countries (Wynne and Marris, 2002). In these countries focus groups were organized to discuss changes in the field of nutrition. The focus groups were filled systematically with persons from relevant groups. For example, mothers with small children were represented as well as senior citizens or high-tech managers. In addition to the factors already mentioned above, there was another aspect mainly in the south of Europe: the fear of women to lose their competence at home. Many of the interviewed women said that it is their special competence within the family to make sure that their husbands and children are provided with a healthy diet. If they were no longer in the position to meet this task, they would lose an important function and the greatest part of their prestige within the family. With the introduction of genetically engineered food these women felt threatened in their competence. They no longer knew what they would be feeding their families. Very likely, no-one has ever thought about this social risk before. Neither did we researchers! This special risk which goes hand in hand with a changing life style does, of course, not only have to do with genetic engineering, but with the industrialization of the food industry as a whole. Genetic engineering has been made merely the scapegoat for the whole development towards industrialization of food. However, scapegoats always stand for more. In this case for the perception of the gradual incapacitation of the housewife due to new foodstuffs whose composition, nutritional value and health effects are no longer accessible to the everyday knowledge of the women concerned.

In contrast to what we found in southern Europe, the more northern countries such as Germany, the Netherlands, or Sweden however quite appreciate Novel Food and especially Convenience Food. In many German panels the tenor was: “Monday to Friday we have convenience food, Saturday and Sunday we have organic food on our tables.” As husband and wife are frequently both working, speedy food preparation during the week presents an important gain in time. In that case convenience food is accepted
as a compromise. Certainly not optimal as far as nutritional value is concerned, goes the opinion of the panelists, but if it saves time it’s ok. “But on Saturdays and Sundays we want to go to the market, buy fresh biologically grown vegetables and prepare everything deliciously.” At the weekend young dynamic manager families have the time to celebrate eating as a social event and maybe even also to “enact” it.

Risk Management: Criteria of Risk Assessment

Once the risks are assessed scientifically and the perceptions are known, society has to make decisions about handling these risks. Risks need to be evaluated and risk reduction measures designed. Many actors of industry and administration will assume management tasks. In food safety the focus is usually on the two classical elements of risk analysis: What kind of adverse affects can be associated with what kind of substance? And: How high is the probability that something will occur?

It seems clear by now that knowledge of probability and extent do not present an adequate information basis for reasonable risk management (see also Frewer, 2001). The reason is that a large part of the uncertainty, part of the confusion caused by complexity and above all ambiguity are not sufficiently covered by the two components probability and extent of damage. Reducing the focus on these two components, the discrepancy between those carrying out food analyses and those perceiving the risks as consumers grows. In order to compensate this gap the German Advisory Council on Global Change (WBGU), consisting of equal representation of natural and social scientists, has requested the German federal government to include additional assessment factors in risk management (WBGU, 2000). This proposal was not only made with respect to food risks but for all risks resulting from environmental and natural hazards. The following additional criteria were entered into the discussion by the WBGU:

- **Assessment (un)certainty** describes the degree of certainty by which experts are able to characterize the risk. This indicator measures the level of the remaining uncertainties and lack of knowledge in the assessment of risks;
- **Ubiquity** defines the geographical range of potential harm (it refers to intragenerational justice);
- **Persistency** defines the temporal extent of potential harm (it refers to intergenerational justice);
- **Reversibility** describes the possibility of restoration, i.e. restoring conditions to how they were before the damage was done, e.g. water purification, reforesting;
- **Delayed effect** characterizes the time period between the original event and the actual effects. The delay can be caused by physical, chemical or biological mechanisms;
Mobilization potential is understood as the violation of individual, social or cultural interests and values. The mobilization potential is evoked by social conflicts and psychological reactions of individuals or groups who feel harmed by the risk effects.

Mobilization potential, the last criterion primarily refers to risk perception and its significance to the political discussion in society. In a narrower sense it can be divided into four important elements (Renn and Klinke, 2001):

- Inequality and injustice with respect to the distribution of risks and benefits over time, space and social status;
- Psychological stress and uneasiness with respect to the risk and its source;
- Potential for social conflicts and mobilization (level of pressure exerted by society or the public on risk regulating authorities); and
- Spill-over effect, which is most likely to be expected when highly symbolic losses impact other areas such as financial markets or loss of credibility with management institutions.

The British government suggested a similar approach (Pollard et al., 2000; Galson Sciences, 2000). The integration of social criteria into the formal process of risk assessment has only just begun and has yet to be refined. Many risk regulating authorities the world over are currently in the process of extending risk assessment in this way.

Extending the assessment factors to include the evaluation of food risks also permits the integration of risk perception factors into the calculation of risk management, thus alleviating communication about these risks. This brings us to the last issue of this paper, risk communication.

**Risk Communication: The Myth of the Public**

When speaking of communication we must take into consideration that in our society the need for communication is highly heterogeneous. Actually, communication with the public is a misleading concept, as the public per se does not exist. All of us are the public, all of us are experts and everyone of us is a member of some group. This means that one must differentiate according to target groups (Yosie and Herbst, 1998). There is no unified overall public, only audiences. Communication needs must be accurately defined for each public. Food risks concern a variety of addressees.

First case: Communication with experts. When communicating with experts their interests generally focus on technical data, such as figures on dose-effect relationships, on the interpretation of exposure data, biological effects and much more. If administrations and regulating authorities are the target groups then the main interest is frequently what scope of risk analyses is available and how affected groups react to these analyses. It is a general truth that political leaders are always faced with a plurality of opinions. Points ratings for risk assessments are rarely immune to political arbitrariness. However, governments and administrations require at least
some margin within which assessments and evaluations are still scientifically
tenable, so that they can differentiate between serious worries and concerns
on the one side and nonsense, scare-mongering or unrightful playing-down
on the other.

Industry is interested mainly in risk analyses resulting in findings with a
strong scientific basis. Where is the evidence, many representatives of the
economy ask. How irrefutable is this evidence? What has been proven
beyond doubt, and what lies in the realm of pure speculation? Moreover,
industry wants to know which sensible and cost-efficient measures for risk
reduction are available, how liability issues were regulated and how the
purchasers of their products will react to the results of these risk analyses.
The ultimate suppliers of products, e.g. the grocery businesses in turn are
interested in obtaining information and advice on how to satisfy the
communication needs of their customers and how to deal with the
consumers’ insecurity caused by the food scandals appearing almost on a
weekly basis. What is the retailer to say when the customer asks: Can I still
eat beef? May I still deep-fry my potatoes? What about the Nitrofen residues
in organically grown food?

This does not yet exhaust the list of possible communication partners. 
Environmental agencies such as Greenpeace or the Sierra Club, consumer
agencies or other so-called NGOs (non-governmental organizations) must
be included here. They, too, have communication needs, but as a rule they
are only peripherally interested in learning how high the risk is or how
relevant health hazards are classified by the regulators. They rather want to
know what concrete steps were taken by industry and the authorities to limit
or avoid the risk. Similar reactions can be seen with the media: How did
managers react to possible dangers? What measures were taken? How were
“innocent” victims protected? Who is to be blamed? Did everyone do their
duty? In media reporting it is decisive to know who has the responsibility
and how the person responsible bore this responsibility in the situation in
question. A popular strategy in the media is to publicly “expose” those at
fault or supposedly at fault. These selection mechanisms shown in the media
are not caused by the cynical attitudes of journalists, but above all by the
preferences of the media consumer. Most people love the archaic ritual of
dragging the guilty ones to the pillory, i.e. in front of the camera. Whether
justified or not, it relieves public conscience and soothes the uneasiness
about one’s own short-comings and the perceived injustices of this world.

Finally it is the consumers who are also communication partners in risk
communication. What information do consumers ask for? Recently, a series
of telephone calls made to authorities or institutes by people who wanted
assurance with respect to the various food “scandals” were analysed in more
detail (Renn, 2003). Most people didn’t ask: How high is the risk, what
adverse health effects can be expected or am I acutely in danger? Most
worried callers rather asked: What can I do? How can I protect myself?
What can I eat without being in danger? Secondarily, people asked for proof
of faith: Who’s telling the truth? Can I trust my butcher? Can I trust my food retailer? Consumers expect competent answers to these questions. Frequently they obtained merely empty statements or popular science versions of the completed risk assessments. However, those were rarely asked for.

After diagnosing the needs of the communication partners the form of communication must be chosen. Basically it consists of four elements (Chess et al., 1989; Lundgren, 1994):

• **Documentation:** this serves transparency. In a democratic society it is absolutely essential that the public(s) not participating in the regulating process learn(s) about the reasons why the regulators opted for one thing and against another. Here it is of secondary importance whether this information can be intuitively grasped or understood by all. This situation is analogous to the information slips packaged with prescription drugs. Almost no-one is able to understand them, save a few medically trained people. Nevertheless these slips have important messages for the average patient, too. They illustrate that nothing is being withheld here. Considering this, documentation in the field of food risks should be much more accurate and timely and it should show how and why decisions in risk management were made, which arguments were considered and what scientific bases were used. A good medium for this purpose would be the internet.

• **Information:** information serves to enlighten the communication partner. Information should be prepared and compiled in such a way that the target group can grasp, realize and comprehend it and can integrate its message into their everyday life. Here it is important that the concerns of those informed are adequately taken up.

• **Two-way communication or mutual dialogue.** This form of communication is aimed at two-way learning. Here the issue is not a one-way street of indoctrinating but an exchange of arguments, experiences, impressions and judgements. When someone comes along and intends to instruct people or educate them no one will be surprised that the instructed will break off the “dialogue” as fast as possible. There must be willingness on both sides to listen to and learn from the other.

• **Participation in risk analyses and management decisions.** In a pluralistic society people expect to be included adequately, directly or indirectly, in decisions which concern their lives. Not all affected people can participate in the regulation, but it must be ensured that the concerns of the stakeholders will be represented in the decision-making process and that the interests and values of those who will later have to live with the risk effects will be taken up appropriately and integrated into the decision-making process.

Effective risk communication implements all four forms of communication in parallel. These four forms meet the various needs of diverse publics which cannot be satisfied by one communication instrument alone. The process of
risk communication should not aim at convincing the other side that a risk is tolerable or intolerable; communication in all four aspects has the principal function of enabling concerned citizens to make their own “risk-judgment”. Based on the knowledge of factually provable consequences of risk-related events or activities as well as the remaining uncertainties and ambiguities, this means that any person or social group affected by risks should be enabled to carry out a personal judgment of the risks in question, a judgment which meets their own criteria or those considered ethically imperative for society. How the assessment of risks by politicians and experts is carried out, as well as the best form, most suitable structure or type of communication process are equally significant to a successful communication. Packaging is important, but the best packaging is of no use if the contents do not live up to the wrapping.

In this respect extensive advice on an effective communication strategy is helpful and useful (Hance et al., 1988; Lundgren, 1995; Gutteling and Wiegman, 1996). In the meantime it is common sense to implement communication early, tailored to the target group, comprehensibly and above all emphatically. Still, the main focus should be on the contents of the communication and not on its form. Successful communication starts with a scientifically sound, subject-oriented process of risk assessment and management appropriate to the value concepts of its society. For this reason particular attention must be paid to understandable methods of risk assessment which take into proper account the concerns of people. Above all it must be ensured that the ever necessary inclusion of value judgments is made transparent and is politically legitimised.

Within the framework of communication it is moreover imperative to address directly the three challenges of food risks mentioned above. Information on complexity, uncertainty and ambiguity must be central elements of the message, as these are three problematic areas which time and again give rise to irritation, misunderstanding and confusion. In the meantime several international colleagues and I developed a special manual for risk communication which shows how these three challenges can be best met (OECD, 2002). It was compiled for the OECD when dealing with chemical risks. A more detailed manual has been prepared in German for the Federal Institute of Risk Assessment in Berlin (Renn et al., 2003).

Conclusions
What conclusions can be drawn from the analysis of risk assessment, risk perception and risk communication?

First of all it should have become clear that it is imperative to integrate various disciplines if food risks shall be treated in an appropriate and consumer-oriented fashion. In order to really appreciate the complex phenomenon of food risks and to consequently achieve improved management results based on risk analysis, numerous disciplines must be called upon, such as food chemistry, toxicology, epidemiology, consumer research,
risk psychology and even applied cultural sciences. Secondly we must be prepared that the types and qualities of risks will change permanently and that we must also be prepared for new risks. The Harvard School of Public Health, one of the most renowned research institutes the world over for this subject, has calculated for the year 2020 that depression will be the most significant and most frequent popular disease in the OECD countries — even before diabetes, cardiovascular diseases or cancer (Klinke and Renn, 1999). To comment on this surprising result would go beyond the scope of this article. It is important, however, that we prepare for changes in the health landscape. The food sector will also be affected.

Thirdly it was found that risk perception also plays an important role in the nutritional field. It entails its own reality whose rules must be observed if risks are to be dealt with adequately and in a consumer-oriented way. Hence, new assessment criteria must be found for risk management, criteria which exceed the classical factors of probability and extent of harm.

Fourthly: Successful risk management depends on successful risk communication. In order to successfully communicate, all four elements of communication must be integrated and applied in parallel. These four elements are: documentation, information, dialogue and participation. Integration of these four elements requires a well-structured communication program. Each element is linked to certain functions. Documentation is necessary to create transparency. Information serves enlightenment, but it does not suffice. Dialogues and participation processes must also be included. Dialogue is a means for two-way learning, a contribution to risk avoidance as well as a means to make people capable of their own risk judgment. Ultimately, participation creates confidence in the risk management process. It cannot be pointed out often enough how important faith is in risk management, particularly with risks which are considered as early indicators of insidious hazards. If this confidence is not given, all that remains is the zero-risk option. In that case any risk management will lead to a stalemate.

Fifthly all four elements of communication must be tailored towards the three challenges of complexity, uncertainty and ambiguity. These three analytical categories can be traced like three keynotes through all phases of risk analysis and regulation. They are the linking elements between science, politics and society.

References


Copyright of Journal of Risk Research is the property of Routledge and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.