

# Agri-food standards

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## Introduction

In this module we look at standards in a greater detail. While certain characteristics, such as sanitary and phyto-sanitary requirements apply specifically to agri-food standards which are the focus of this chapter, for didactic purposes we will consider some aspects of standards in general as well.

We have experience standards in our everyday lives.

- Sometimes the experience is **positive** (McDonalds tastes the same regardless of where you go);
- Sometimes **negative** (your US hairdryer running on 110 volts burns when plugged into the 220 grid).

Standardized are shipping containers, measurement units, computer systems, sizes of screws and bolts, etc. *Standard* examples of standards are the lack of standardized language wreaked havoc at the Tower of Babylon in biblical times, or non-conformity of fire hydrants during the great Baltimore fire in 1904, when firefighters called in from neighbouring cities were unable to fight the blaze effectively because their hoses would not fit the hydrants in Baltimore.

Standards are increasingly present in domestic policies and more and more important for international trade.

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.



## 1. Concepts behind standardization

Products face many requirements:

- on ingredients,
- performance,
- design,
- production processes,
- packaging,
- life cycle, etc.

These requirements come in a form of standards. We can talk about:

- product standards,
- process standards,
- environmental standards,
- labour standards,
- corporate social responsibility standards, etc.

Standards in essence are **norms**, although they might not always deal with measurable attributes.

We already discussed one non-measurable standard: a HACCP.

Among factors accounting for heightened standardization activity are:

- Demands by consumers for safer and higher quality products.
- Technological innovations and the need for compatibility in production.
- The expansion of global trade.
- Increased concern over social issues and the environment.

There are three economic concepts supporting standardization:

- **Network externalities and compatibility.**
- **Imperfect information.**
- **Negative production and consumption externalities.**

In the agri-food sector the most prominent ones are imperfect information and externalities.

## 1.1. Compatibility and network effects

In manufacturing we often discuss **compatibility and network effects**. Compatibility is crucial for two reasons: compatible products can be substitutable as inputs into production allowing to use the best supplier, and to achieve economies of scale.

For example, if goods were not compatible, machinery would need to be re-calibrated after each batch.

The concept of a network is a newer one. The value of a network increases with the number of users using a particular network, which is only possible when they subscribe to the same standard.

Consider an example of a word processor or a fax machine. A fax machine is only useful if it allows the sending faxes to other members of the network.

Compatibility can be achieved in two ways:

- **Standardization**, when products are produced to certain specifications.
- **Adapters**.

Both options come at a cost: the cost of the adapter is the adapter itself. The cost of standardization is a loss in terms of product variety. Network effects are often associated with problems of coordination where market forces –or a government intervention– can yield inefficient outcomes.

There are no *traditional* network externalities in agri-food production, although certain network effects occur with certification or labelling. If a label is voluntary, the more it is used, the wider it is recognized and the higher the value of the label. Perhaps one could also consider food safety standards being a form of network standard although in a narrower sense. Globalized sourcing allows securing supplies from various sources assuming a minimum food safety standard is met.

## 1.2. Imperfect information

**Imperfect information** characterizes many situations. Imperfect information occurs when one of the parties –often the producer or seller– is better informed than the consumer or buyer. In economic terms, this situation is called *information asymmetry*. Information asymmetries occur when producers have information about characteristics of goods they produce which users do not have when purchasing those goods. Consumers can be either:

- downstream processors or
- final consumers.



Information asymmetry in these cases can hamper the functioning of the markets. Standards remove information asymmetry and lower transaction costs on the market. The information asymmetry is the most prevalent in the case of product safety, food safety included. Depending on the nature of the product, a standard could be complemented by labelling.

Sometimes none of the parties –producers or consumers– has the information necessary to make a fully informed decision. This case is called a case of missing information and includes situations like the long-term impact of ultrasound, long-term impact of high concentration of heavy metals, etc.

### 1.3. Externalities

Last but not least, the concept behind standardization is based on negative production and **consumption externalities**. Externalities are a form of market failure that occurs when resources are not properly priced and production (or consumption) of a good places a burden on other economic actors. In the area of the environment, producers can use resources up to a point that is not socially optimal.

For example, in the absence of regulations setting the maximum amounts of pesticide residues, farmers would be inclined to increase the use of pesticide without taking account of the negative effects on the environment or on consumer health. In this case, the externality occurs at the production point.

To manage production externalities, economic theory suggests the use of taxes, although governments prefer using performance standards, regulations and other tools despite the fact that regulations are less efficient than taxes.

Another example is an environmental standard directed at processes, such as CO2 emissions.

Standards directed at mitigating the effects of environmental externalities are particularly tricky in the international setting. For example, standards directed at a certain domestic externality can be attempted to be applied to imports as well. This approach might work when the externality is transboundary but will not work for local externalities. One also has to keep in mind that production processes differ across countries and what creates an externality in one country could have smaller or larger effects in a different country.

An externality can occur also at the consumption point. A frequent example includes pollution that occurs when a consumer drives a car.

## 2. Positive aspects of standards

Standards help deal with market failure by increasing economic efficiencies, ensuring the smooth functioning of the market, and conveying information to consumers about products. In production, standardization assures:

- interoperability of production,
- network externalities,
- economies of scale,
- guaranteed demand, and
- minimising the risk of litigation.

As such, standardization thickens the supplier's market (that is, there are more suppliers of the same product) and is essential to ensure compatibility of inputs and adequate quality, leading to lower prices. Consumers benefit from a flow of information about the product. Standards reduce transaction costs and facilitate trade, both domestic and international. In the case of safety standards, welfare increases as a result of higher safety. Consumers by definition value variety, and a broad variety of goods on the market responding to various consumer preferences is welcome. This occurs in cases when there are network externalities; or when some varieties can be harmful, setting a common standard can be beneficial.

On the development front, specifying market requirements standards, when properly administered, can act as an engine of growth by increasing exports in poor countries. This is because participation in global markets has, as a prerequisite, production of goods that satisfy demand. In addition, the distribution of welfare in a developing country is to be considered. Standards can also serve as transmitters of technology.

### 3. Negative aspects of standards

Standards decrease variety on the market. Compliance with standards is likely to increase the cost of production, although this burden falls more on small and medium enterprises. Producers have to reconfigure their production to reflect a new standard, which may result in increased costs.

In the case of network externalities, tipping refers to a tendency for a single technology to dominate the whole market once it reached a critical mass, even if some would consider the technology inferior compared to other alternatives.

An example would be a Windows operating system.

Concerns associated with tipping include anti-competitive practices.

Many studies suggest that technical regulations in developed countries constitute a considerable obstacle to agricultural and other exports from developing countries.

While developing countries are likely to have a comparative advantage in labour intensive industries such as productions of fruits and vegetables, standards –both public and private– are often perceived as a threat to subsistence farmers in developing countries, because multinational companies and large-scale producers are better able to adjust their production to reap the benefits. The costs and structural changes associated with standards compliance can cause significant redistribution of welfare –not only across countries but also along supply chains and in rural societies.

#### **Bibliographical reference**

(Otsuki et al).

#### **Bibliographical reference**

**World Bank** (2005). "Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports". Washington, D.C.

## 4. Vertical vs. horizontal standards

Product standards are important for products with differentiated varieties. Two types of product differentiation are possible:

- **Vertical.** Different varieties can be ordered according to a certain scale. For example, milk can be ranked according to its fat content, chocolate according to cocoa content and beer according to alcohol content. An important feature of vertical differentiation is that it often leads to price differences among varieties. Vertical differentiation does not imply that full-fat milk is better than skimmed milk.
- **Horizontal.** In this case, products cannot be ranked. Wheat beer and barley beer, even if they contain the same amount of alcohol, are different. In reality, products can be differentiated along both lines.

We often hear about a *race to the bottom*. To avoid a *race to the bottom*, only products that meet certain minimum standard are allowed to be marketed. As such, the concept only applies to vertically differentiated products. Setting up a minimum standard does not prevent a product which exceeds this minimum standard from being circulated on the market.

## 5. Public vs. private standards

Standards can be divided into:

- **Public.** A public standard implies an existence of domestic law which refers to the standard. It is assumed that the interests of all actors in the society are taken into account.
- **Private.** Private standards are introduced in response to increased consumer demand for food safety and quality as well as competition reasons as a product differentiation tool. Private standards usually affect fresh products which are the most prone to outbreaks. Many large retailers and food companies have established (private) food standards covering food safety and quality at levels comparable with or higher than public standards. The standard is chosen to maximize the firm's profits.

The line separating public and private standards is not always well demarcated and it considers in whose interests the standards might be set. Of course private standards can take into account other factors as well, for example environmental externalities and consumer interests, but only if these interests correspond to the firm's interests.

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

## 6. Mandatory and voluntary standards

- **Mandatory public standards** mean that only goods satisfying a certain standard can be circulated on the market, such as those containing less than x percent of a pesticide residue.
- **Voluntary public standards** are products not satisfying those standards and can be also circulating on the market, often with a relevant label.

Private standards are by definition voluntary (although some argue that they became *de facto* mandatory for small producers to succeed). Public standards, on the other hand, can be either mandatory or voluntary. Often mandatory and voluntary regulations are intertwined.

Mandatory standards limit the number of varieties on the market. A label applied in connection with a voluntary standard can be:

- Positive:
  - *may contain traces of peanuts.*
  - *contains omega-3 fatty acids.*
- Negative:
  - *does not contain Monosodium glutamate.*

The choice between *negative* or *positive* labelling determines who carries the cost of labelling. In case of negative labelling, producers (and, thus, ultimately the consumers) of goods non-complying with a standard bear the burden. In the case of positive labelling, producers meeting the standard face the cost. A body of research studies consumer reactions to different types of standards.

Labelling is often related to standards but can also be supplied for information, such as nutrition labelling on foodstuffs. If a label is not mandatory, producers can still decide to supply it voluntarily to signal to the customers that their product meets or exceeds a standard. This would happen if a negative label is not mandatory and producers want to differentiate their product.

WTO legal vocabulary differs from vocabulary used in economic analysis. In the language of the agreement on **Technical Barriers to Trade (TBT Agreement)**, technical regulations are mandatory while standards are voluntary.

## 7. Product and process standards

Product standards are related to attributes of the products. They specify the characteristics of a product:

- Design
- Size
- Weight
- Safety
- Energy
- Environmental performance
- Interoperability
- Material
- The process of production

As we already discussed earlier, some product standards can be ranked while others cannot.

Process standards specify the characteristics of a production process.

Process standards are introduced because they affect the goods that are produced (such as hygiene standards), because they affect the efficiency of the production process (e.g. in the case of network externalities), or because they affect the environment (e.g., pollution standards).

Unlike products, production processes are not traded. Process standards, thus, have an *indirect* relevance for trade, making them a challenge for the trading system.

There is a general agreement on what constitutes a process standard. There is a less of an agreement on whether the process is or is not reflected in the product. In the WTO terminology we refer to them as:

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

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WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

- ***Incorporated processes and production methods (PPMs)***. In trade, they are relatively straightforward and can be treated as an additional product attribute.
- ***Unincorporated PPMs***.

However, even in case of unincorporated PPMs governments and consumers in an importing country could care about how the product was used.

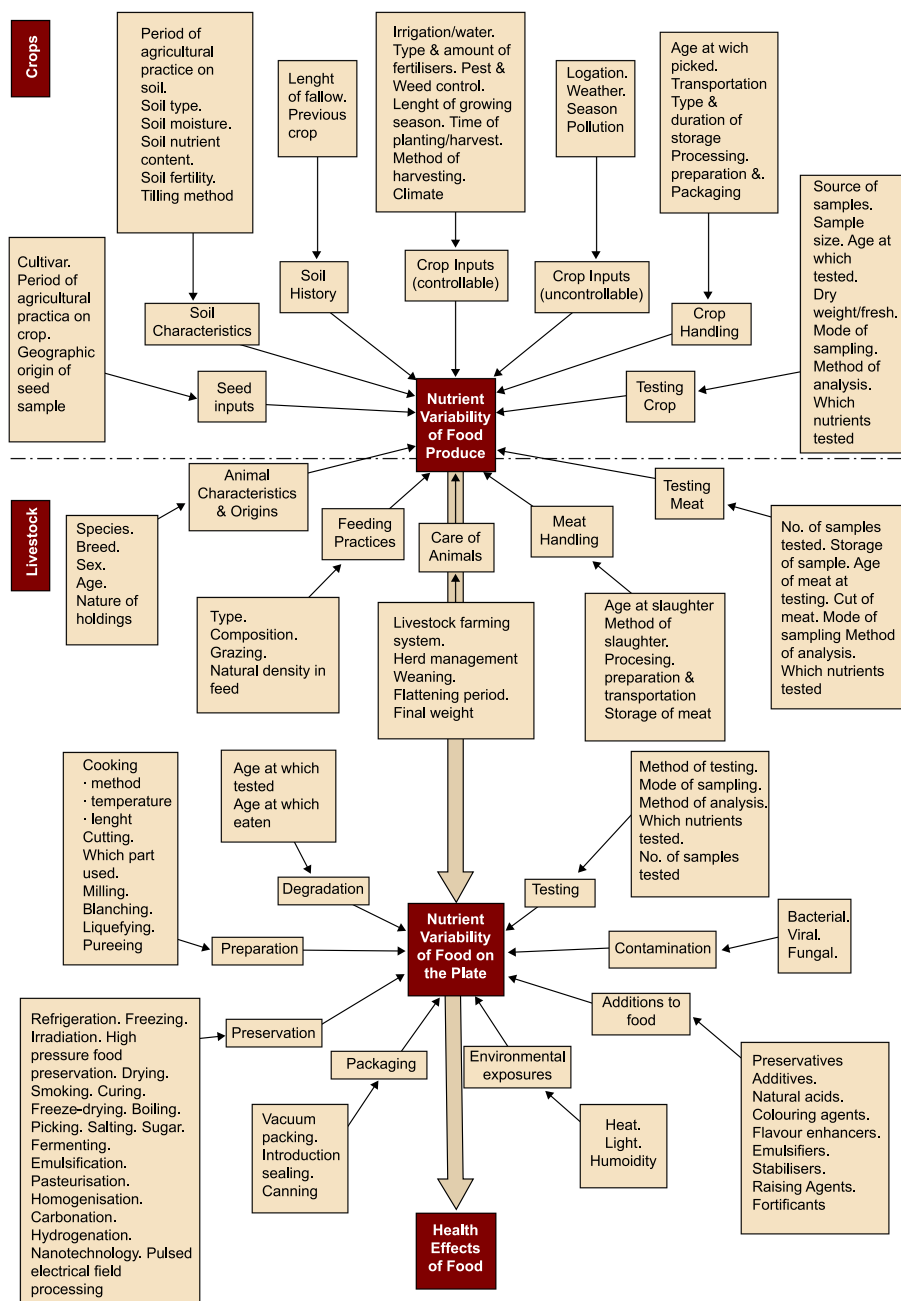
We have already discussed one process standard: the HACCP. Codex standards are "food requirements intended to provide consumers with a sound, wholesome food product free of adulteration, correctly labelled and presented". Codex standards use the HACCP in development of standards, incorporate risk analysis and are flexible to allow members to incorporate them into existing legislation.



## 8. Standards according to use

We will now discuss types of standards according to their use. The *taxonomy* is not clear cut, as a standard can belong to more than one category. For example, there could be a private standard specifying the amount (*target*) of a certain pesticide residue in a product. Of course, products can be subject to more than one standard. However, the following discussion should help us in understanding different types of standards.

We start by presenting a figure that schematically shows different factors that influence nutritional variability of food, and thus points out the challenges of setting up comprehensive standards.



Factors that influence nutritional variability of food  
 Source: <http://www.food.gov.uk/multimedia/pdfs/organicreviewappendices.pdf>

### 8.1. Standards of identity and composition

Consumers are interested in knowing the nutritional value of their food as well as other components of their food. Standards of identity and composition were among the first ones to be specified to assure the identity of products and prevent the adulteration of products. Composition standards are not new: Greeks and Romans were known to take measures to prevent wine makers from colouring and flavouring wine.

Adulteration is defined as reducing the purity of a good by adding a foreign or inferior substance. Some forms of adulteration, although reducing the purity of the product are harmless to the consumer.

Examples of *traditional* but harmless methods of adulteration include adding water to wine and milk, de-creaming milk, starch to meat products, margarine to butter.

Adulteration, although undesirable in any case, is particularly detrimental when it is poisonous, deleterious and injurious.

Examples of harmful adulterations include adding sand to brown sugar or chalk to flour to make up the weight.

Sometimes adulteration is done to improve the performance of the products (discussed later in the chapter).

A recent example of harmful adulteration was adding melamine (a chemical used to produce plastics) to milk in China to increase its apparent protein content. Tainted milk was used as an ingredient in an infant formula in China in 2008. At least six infants died and thousands became ill.

It is interesting to note that deleterious substances include in addition to chemical also mechanical, physical and bacterial agents. As such, shell fragments in unshelled seafood could be declared adulterating it. Perfect purity might be difficult to accomplish in some cases, so tolerance levels are defined. With advancement in science and technology, adulteration can be studied in greater detail.

Legal minimum composition standards are mandatory.

- Composition standards allow identifying products and help to ensure that those products meet consumers' expectations regarding composition, characteristics, and product safety. Examples of standards of identity are plentiful: the share of cocoa in chocolate to be called chocolate, the share of meat in sausage, the share of fruit in jam, etc.
- Composition standards also include additives. Additives can be either:
  - **Direct.** They are substances intended to use in food.
  - **Indirect.** They become part of food from processing, packaging, etc.

Some colourings and flavourings could be examples of adulteration, although those are often desirable unless they are used to disguise poor quality.

- Composition standards also demonstrate nutritional value and safety, such as vitamins added to milk or iodine added to salt.
- Composition standards are also required for *modified* versions of food, such as reduced-fat, although modified versions of food have to satisfy additional requirements, such as nutritional equivalence, in addition to standard requirements.
- Composition can be shown using analytical and calculation methods.

Once the composition is set, the outcome is usually communicated to the consumers. Most countries have rules for labelling, with nutrition labelling being very frequent. Labelling serves as a conduit for informing consumers about the composition of a product and is particularly important to those allergic to certain ingredients. Similarly, composition labelling is crucial for novel foods, such as presence of GM ingredients.

## 8.2. Target standards

Identity and composition standards discussed above are one example of target standards.

A target, for example, can be the minimal content of a certain ingredient needed to fulfil composition standards.

Target standards also include the prescribed weight, appearance, or volume. Other target standards, for example food safety standards and environmental standards are also in a form of *extreme* standards:

- **Minimums**, for example nutrition levels
- **Maximums**, for example, residue levels

While some attributes, such as desired size, colouring or shape can be assessed visually, many attributes of products can be measured in the form of performance. Examples of performance standards outside the agri-food sector include (minimum) energy efficiency, (maximum) flammability of materials, (minimum) crash resistance, etc.

They are equally important in the agri-food sector even if the concept might differ. Performance standards are of particular importance when visual and mechanical methods fail.

For example, a pathogen contamination in meat cannot be detected by visual inspection.

Likewise, visual inspection will not reveal residue levels for pesticides, metals (lead, mercury), chemical contaminants (dioxin), or microbiological contaminants (bacteria, moulds, fungi). A product can be judged against a certain performance, as can be a process, such as sanitation performance standards.

Food safety can be defined in terms of performance. The **Codex Alimentarius Commission (CAC)** defines the performance objective of food safety as:

"the maximum frequency and/or concentration of a hazard in a food at a specified step in the food chain before the time of consumption that provides or contributes to an ALOP (Appropriate level of protection), as applicable".

**Codex Alimentarius Commission (2004).**

Determining ALOP requires exterminating the appropriate level of protection for different vulnerable subpopulations. Subpopulations performance standards in agri-food sector help:

- assure product safety
- maintain consumer confidence
- provide economic incentives for industry to find more efficient means of meeting food safety goals

While zero tolerance or zero residue levels are often impossible to achieve, there must be a reasonable certainty of no harm. Minimum or maximum standards are based on toxicity studies on toxicological limits. Toxicological limits measure the acceptable daily intake of a specific substance, which is deliberately used in the production process, like a food additive, or a residue of a veterinary drug or pesticide in food or drinking water that can be ingested over a lifetime without a significant health risk. Many substances occur naturally in food and drinking water. Some substances deteriorate over time, while others accumulate in the body, such as heavy metals or dioxin. Longer term health effects of some substances are not yet fully explored.

The **Maximal Residue Levels (MRL)** are a legal limit which is based on tolerable daily intake of harmful substances including an extra safety margin. Alternatively, MRL can be also based on the maximal residue levels of pesticides in the environment as those can often be lower than the level that is still considered safe for humans. In case of very detrimental substances, bans can be justified. The same applies for pathogens, foodborne illnesses (such as listeria), etc. Risk, for example in case of toxic substances, depends on toxicity and exposure.

### **8.3. Food safety standards**

Food safety standards include standards we already discussed, including composition and target standards described above as well as the HACCP process and labelling standards. However, food safety does not only concern grocery related items. With increasing shares of food eaten away from home, food preparation standards are increasingly important in assuring food safety so that food does not become unsafe or unsuitable.

Food premises, for example, have prescribed hygiene standards to reduce risks of food contamination. Furthermore, countries usually impose specific requirements regarding food handling (including transportation and storage), processing, recall, health and hygiene, etc.

Particularly important are temperature controls for foods that can become potentially hazardous such as raw and cooked meats and meat products, dairy, seafood, fruits and vegetables, products containing eggs, etc.

The challenge pertains to determining the optimal level of mandatory food safety standards and control, and to finding the optimal balance between mandatory regulation, private or self-regulation, and voluntary certification initiatives.

#### 8.4. Marketing standards

Marketing standards lay down requirements for products to be marketed. Unlike composition and identity standards that describe the composition of the product in detail, marketing standards lay down *the while package* for products to be marketed. Marketing standards, just like other standards, are designed to facilitate the proper functioning of the markets. Marketing standards also serve as a tool for price reporting and eligibility for market intervention measures (where applicable). They assure *sound, fair and marketable quality*. Sometimes they are also called quality standards although as we will discuss later, quality is a rather subjective concept. They do, however, set a minimum *quality* concept.

Products can satisfy basic food safety standards and might not satisfy marketing standards. Marketing standards in the EU aim *to avoid consumer deception about product qualities*.

EU marketing standards for agricultural products and some processed foods, for example, are regulations that lay down definitions of products, also referred to as *product identities*, minimum product standards, production methods, product categories and labelling requirements.

Marketing standards elsewhere could also include classification and sizing, and possibly other elements.

Many EU marketing standards are based on those agreed internationally in the Codex Alimentarius or the **United Nations Economic Commission for Europe (UNECE)**. Where no EU marketing standards exist, international standards are used as a reference.

Unlike composition standards, marketing standards do not have to cover all products. They usually cover unprocessed or relatively little processed products. Marketing standards in the EU cover the following product categories:

- beef and veal
- coffee extracts
- fruits and vegetables (excluding potatoes)
- sugar
- fruit jams
- jellies and marmalades
- milk
- olive oil
- spirit drinks

#### Bibliographical reference

<http://europa.eu/rapid/pressReleasesAction.do?r=09/842&format=HTML&aged=0&language=EN&>

- cocoa and chocolate products
- eggs
- fruit juice
- wine
- honey
- hops
- poultry
- spreadable fats

The first harmonized marketing standards in Europe were established under the auspices of the **UN Economic Commission for Europe**, and in particular the **Working Party on Agricultural Quality Standards**. Later, the OECD was also interested in these issues for international trade facilitation. A **Codex Committee on Fresh Tropical Fruit** and later a **Codex Committee for fresh fruit and vegetables** serve as a forum for the international harmonization of fruit and vegetable standards. The first marketing standards for fresh food and vegetables in the EU were established in the 1960s. EU marketing standards for vegetables have a negative reputation for prescribing details of products, such as the curvature of cucumbers that could be sold on the market. Some of the EU marketing regulations have recently been simplified.

Reformed marketing standards in the EU only include minimum requirements and no longer require quality classification and sizing. However, products in compliance with UN/ECE standards which do require quality and sizing information are considered in compliance with the EC standard, called the general marketing standard.

We will not discuss other marketing standards in great detail but will mention some interesting bits and pieces to show the influence of marketing standards. In the case of fruit juice, the three main products are defined as fruit juice, fruit juice from concentrate, and fruit nectar. The Codex Alimentarius Commission is a taskforce dealing with fruit juices. In addition, in Europe, an association of fruit juice producers elaborated a code of practice setting quality requirements and criteria for the evaluation of identity and authenticity of fruit juices.

Eggs finely demonstrate the asymmetric information problem. While size (XL, L, M, and S) is easily accessed by consumers, other characteristics, such as timing and production methods under which eggs were produced, are not. In the EU, producers can use the denomination *extra* or *extra fresh* on a voluntary basis up to the 9th day after eggs were laid. Also in the EU, production methods are marked by a code and wording on the egg as follows:

- 0 for organic eggs
- 1 for free range
- 2 for barn
- 3 for cage

Wine, for example, can only be produced from grapes and produced in accordance with approved oenological practices. Chocolate in the EU can contain up to 5% of certain vegetable fats other than cocoa butter, which must be indicated on the label.

The potato sector in the EU opposes the enforcement of a European marketing standard for early and ware (eating) potatoes, as the potato production processes such as varieties and growing conditions and the markets (presentation, packaging) are largely differentiated in all EU member states. Consequently, the retail sector is defining different quality classes to fit consumer demands.

Marketing standards can be public and private, although as we will discuss later, private standards are often based on public standards but with a stronger enforcement mechanism.

#### Bibliographical reference

<http://www.freshquality.org>

### 8.5. Grades

Grades and sizing are often part of marketing standards, although grades and sizing are also important in sectors where marketing standards do not exist. Grades and sizing bring uniformity and allow smoother interaction in the market.

### 8.6. Processing standards

The contemporary consumer places more and more emphasis on the production processes. Processes are not traded but the products they produce are. International trade law (covered later in the text) finds dealing with processes challenging. Process standards are used because:

- they affect the products that are produced (for example, food safety and hygiene).
- they affect the efficiency of the production process (for example, in the case of a network externality), or
- they affect the environment (for example, pollution standards).

The first category is called *incorporated process and production methods (PPMs)* or sometimes *product-related methods (PPMs)*, while the second and third categories are called *non-incorporated processes*.

As already discussed, the HACCP is an example of a processing standard. Processing standards could also be in place to mitigate effects of production externalities. The challenge of process standards lies in the fact that, unlike products, processes are not traded although they can be detected in the final product. Different outcomes can be achieved using different processes. For example, assume that the goal is to reduce pathogens in poultry. This can be achieved by treating the poultry with a chlorine wash, as is customary in the United States. Alternatively, the EU strives to achieve the same outcome of

#### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.



pathogen reduction using other methods, namely preventing the contamination in the first place. Indeed a trade dispute has been running between the EU and the US on this topic.

Another example is food radiation, which is generally accepted in the EU while it is challenged in the United States.

### 8.7. Labelling standards

Labelling means "any words, particulars, trademarks, brand name, pictorial matter or symbol relating to a foodstuff and placed on any packaging, document, notice, label, ring or collar accompanying or referring to such foodstuff", and may not be misleading.

The purpose of government involvement in labelling is to prevent fraud, deception and misleading statements on the labels. Some labelling policies are put in place as governmental incentives to improve human health and safety, mitigate environmental hazards, avert international trade disputes or support domestic agricultural and food manufacturing industries. Mandatory food-labelling requirements are best suited to alleviate problems of asymmetric information.

Labelling can also be introduced as a response to consumer demands, as was the case of the dolphin-tuna labelling.

The purpose of the labels is to inform the consumer about the product and its attributes, many of which cannot be verified at the time of purchase.

Labelling can be:

- **Mandatory or voluntary.** Consumers are usually passed on the cost of mandatory labelling, such as nutritional labelling, country of origin labelling, etc., even if they do not care about the label. In case of voluntary labelling, the producer tries to differentiate itself from unlabelled counterparts. Labelling allows charging a premium from consumers who care about the attribute marked on the label.
- **Positive or negative.**

Labelling, however, can turn into a barrier to entry if the certification is not available to all producers.

**Bibliographical  
reference**

USDA Report

Labelling must be done in a language that is easily understood. Labelling requirements could differ across countries. In the EU mandatory labelling includes:

- The name under which the product is sold.
- The list of ingredients.
- The quantity of certain ingredients or categories of ingredients.
- The presence of allergens.
- The net quantity in the case of pre-packaged foodstuffs.
- The date of minimum durability or, in the case of foodstuffs which from the microbiological point of view are highly perishable, the *use by* date.
- The name or business name and address of the manufacturer or packager, or of a seller established within the EU.

Unlike in the US, nutrition labelling is not yet mandatory in the EU. Under Codex Alimentarius, food labelling requirements include:

- Name of the food.
- List of ingredients in descending order.
- Net weight.
- Name and address of manufacturer.
- Country of origin.
- Lot identification.
- Date marking and storage instructions.
- Instructions for use.

An important aspect of labelling is health claims that describe the connection between a nutrient or food substance and a disease or health related condition. Health claims, e.g. claims about the effects of a certain food on health, must be approved and science-based. Foods bearing health claims are sometimes called *functional foods*. These can occur on regular foods in the supermarket (such as oatmeal and cholesterol; calcium and osteoporosis, etc.) or on dietary supplements. In some countries (such as the United States) dietary supplements are available in grocery stores and represent a growing market. For regulatory purposes they represent a *separate regulatory category of food* and are defined as a product intended to supplement the diet that contains one or more of the following dietary ingredients:

- vitamins
- minerals
- herbs
- aminoacids
- some combination

They must be labelled *dietary supplements*. Unlike drugs, dietary supplements do not need to undergo pre-market testing and approval procedures.

Labelling is also a thorny issue in the case of materially different products. For example, GM foods in the EU must be labelled while in the US labelling of GM foods is necessary only when the product is materially different from its non-GM counterpart, which is when it is different in quality, safety or nutritional composition. In the EU, labelling is necessary when food products have been found *no longer equivalent* to their traditional counterparts as determined by scientific assessment. According to an international agreement signed by 130 countries in January 2000, exporters must be required to label all GM foods, and importing countries retain the right to refuse GM foods if they so choose based on their weighting of potential risks. In the EU, specific labelling requirements include mentioning the presence of additives, novel ingredients and GMOs on the label.

Labelling can also be part of marketing standards. For example, EU marketing standards for fruits and vegetables require some elements to be labelled on any package of fruit and vegetables: name and address (or code allowing tracing it back) of the product, name of product is not visible, quality class and country of origin. Additional information can be added: type or variety where not evident from the appearance (navel orange, red navel orange, Valencia orange, etc), sizing and crop year if applicable.

Labelling also includes communicating to consumers the results of certification. Labelling, nevertheless, cannot be misleading as to characteristics of the food stuff and its nature, identity, composition, quantity, origin, etc. or by attributing to the foodstuffs effects or properties which they do not possess. It is also prohibited to suggest that the foodstuff possesses special characteristics when in fact all similar foodstuffs possess such characteristics. Labelling standards also include misbranding. While the word is tricky, misbranding means presence (or absence) of information on the label of a product that is false, misleading, or deceptive.

Labelling too comes at a loss. One of the EU projects looked at food safety information obligations under Directive No 2000/13/EC (*Labelling Directive*) which carried an administrative cost of 630 million euros. The European Association of Craft, Small and Medium-sized enterprises puts the costs of changing a label at 56 euros.

## 8.8. Packaging standards

Packaging prevents the contamination of products and, as such, packaging standards play an important role. Packaging also influences the economies of scale in transportation. For example, standard packaging assures products are compatible in shipping and can be transported on a pallet or using a standard container. With increasing interest given to environmental considerations and waste liquidation, excess packaging is also getting attention. Packaging standards can also include details about labelling.

### Bibliographical reference

[http://ec.europa.eu/agriculture/quality/policy/com2009\\_234/ia\\_en.pdf](http://ec.europa.eu/agriculture/quality/policy/com2009_234/ia_en.pdf)

## 9. The development of standards

In autumn 2009, the **International Standardisation Organisation (ISO)** has a portfolio of some 17,000 standards. For comparison, by the end of 2004, ISO had published some 14,900 international standards. **Perinorm**, a consortium of European standards organizations, maintains a database of around 1.1 million standards (national, regional, and international) from about 21 countries. For comparison, at the end of 2004 it was 650,000 standards from 21 countries.

The activity tends to highlight the constant development of standards. We will consider some aspects of standards development in this part.

### 9.1. Procedures and organizations

Standards can be developed:

- **Nationally or internationally**
- **Publicly or privately**

Standards-setting involves a diverse group of actors from:

- Government bodies
- Industry groups
- Consortia of firms
- Individual companies
- NGOs

The general trend is towards separating standardization activities from regulatory activities, with the former left to the private sector and the latter with the public sector. Many standards are set by private organizations and entities. In some countries, such as the United States, even national standards are developed by private bodies. In general, regulations concerning safety, health and the environment are issued by governments. Often, however, the specific measures that satisfy the objectives of government regulations are spelled out in technical standards developed by private organizations.

Standards affect both consumers and producers. By definition, they ease interaction on the market and, as such, must comply with changing market conditions and consumer demand. In order to design (public) standards, governments need information from both consumers and producers. Producers have

#### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

#### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

#### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

an interest in influencing the design of standards in order to obtain an artificial advantage over foreign competitors. If they succeed, the resulting standard will tend to lower both trade and welfare.

The choice of a standard might not be easy, as local standards reflect technical capacities of producers coupled with societal values. In some cases, local standards might serve as a means of protecting local producers.

The development of standards –and other regulations for that matter– should be transparent and accessible. Standards must be designed and implemented such as to avoid the misappropriation or capture of public policy to construct unwarranted obstacles to competition and trade.

The national standardization infrastructures of most industrial countries are now integrated into the network of international standardization. Change in the standardization fields is putting pressure on governments in developing countries to reform and develop their standardization infrastructure.

Both the demand for standards infrastructure and the capacity to implement standardization activities depend on factors correlated with a country's level of development. Standards institutions in poorer countries are generally in the public sector with little or no participation of the private sector.

The process of establishing voluntary, consensus-based standards, and in particular the procedures used by ISO and many of its member bodies, are regulated by the WTO and ISO codes of good practice. Recent approaches to standardization require standardizing bodies to focus on the development of voluntary rather than mandatory standards.

## 9.2. The use of science and technology

The relationship between science and technology and standards goes both ways. Just like science and technology contribute to the development of standards, standards also include technology content and contribute to technology diffusion. The information contained in non-proprietary standards is in principle accessible to everybody. Standards act as catalysts for the spread of innovation to the market. To the extent that standards incorporate information about a particular technology, they create a means of diffusing know-how internationally. A mature technology adopted as an industry standard in developed countries may still represent an advance for firms in developing countries.

Science is the observation, identification, description, experimental investigation and theoretical explanation of natural phenomena. An often heard critique today deals with the lack of faith in science following the handling

### Bibliographical references

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.  
<http://www.foodstandards.gov.au/standardsdevelopment/>

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

of catastrophes starting from the Chernobyl tragedy in 1986 and the later handling of the food scares. More precise science and better testing allow for tighter standards.

### 9.3. Social, cultural and political surroundings

**Non-governmental organizations (NGOs)** are active in the standard setting process, especially in the area of:

- Labour standards.
- Environmental standards.
- CSR standards.

The social, cultural and political surroundings also influence standard setting activity. Many standards can be tied to local customs. An example could be the menu in fast food restaurants that, although keeping the original theme, is often adjusted to local tastes. The same applies to food products that are marketed on different markets under the same brand name but with different compositions (more sugar, for example) to suit the local tastes.

### 9.4. Supply vs. demand driven standards

Standards, by definition, ease interaction on the market and, thus, should respond to both producer and consumer demands. This is less the case in the area of agri-food, but a large chunk of industrial standards is driven by compatibility and efforts to capture network externalities. Examples of network externalities in the standards are a qwerty keyboard, VHS video tapes, Windows operating system, etc. Governments usually do not intervene in network industries as compatibility standards are likely to result from the interaction of market forces.

Network industries have a technology to tip once a critical mass was established. A danger of some of the supply driven standards in an environment of network externalities could be a technology lock-in. Governments, however, do intervene when a dominant form imposes its own standard or pursues anticompetitive behaviour. We will mention some aspects of network industries.

Private standards (discussed shortly) have a better track record of responding to rapidly changing consumer demand. For example, following Stern's report on climate change, consumers started paying more attention to the origin of their food in an attempt to reduce the carbon footprint embodied in food miles. A private initiative responded to their demand (at least in the UK).

#### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

## 9.5. Ethical issues (domestic and international)

The toughest standards to set are standards or regulations that include some sort of value judgment, such as questions of animal welfare. Ethics is a systematic study of values, moral concepts and principles that determine what ought to be done. While the basis for establishing animal welfare standards is scientific, there are moral judgments to be made. Moral perspectives serve as the basis for treatment of animals where different philosophical approaches see animals differently.

Within a society, the basic ethical considerations of what is right or wrong are captured in law. Governments might be tempted to respond to societal demands and introduce additional legislation, for example in the area of animal welfare or labour practices which would result in higher prices. If there are consumers in the society who are indifferent to the issue, they will end up paying higher prices even though they do not place a higher value on the *more ethical* product. In these cases, mandatory standards are not the most efficient. A better way is to introduce a voluntary standard with labelling to let consumers decide.

## 10. The application of standards (legal considerations) and their implementation

As already discussed, standards can be voluntary or mandatory. There are a number of advantages to mandatory product standards which lead to their wide application by governments:

- The use of technical standards can build on experience and scientific knowledge about the likely effect of a product standard on consumer safety.
- Conformity with technical standards provides an objective and easily monitored benchmark for the regulator.
- The imposition of product standards is more likely to convey to consumers that public attention is being paid to important safety issues and that action is being taken by responsible authorities.

However, mandatory product standards can create a moral hazard which would result in consumers believing that government intervention has eliminated all hazards and be less cautious about using the product.

Codex standards are not binding until adopted by a member country but ratification is mandatory.

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.



## **11. Accountability, transparency, and enforcement**

Government has enforcement responsibility, but manufacturers, distributors, retailers, importers and other players are expected to comply. In case they do not comply, they face liability for non-compliance.

## 12. Private standards

Private standards are not a new occurrence. Business-to-business standards in a form of contract specification have been present on the markets for a long time. *Private* entities in the discussion of private standards include food processors and retailers.

What is new, however, are considerations of the impact of a concentrated retail sector's requirements on small farmers the entrance of which to the market was facilitated by globalisation. We will discuss case studies later in this part.

Food processors and retailers define private standards in order to:

- meet their liability with respect to food safety (*baseline standards*), and
- guarantee their reputation with respect to food quality and such social concerns as the environment, animal welfare, fairness and corporate social responsibility (*assurance standards*).

The WTR defines private standards as those that take into account the profit maximization element.

Retailers and processors impose standards to protect their profits. Alternatively, a definition can rely on who establishes the rules:

- A government endorsed body, which could be either public or private.
- A private entity.

A number of private food safety standards and initiatives (*baseline standards*) in the agri-food sector increased in an effort to gain legal security responding to more stringent public regulations (*1990 UK Food Safety Act* and later the *2002 EU General Food Law*) and to protect the retailers' reputations as a provider of safe food as food scares are costly for supermarkets, the increasing concentration and size of manufacturers, wholesalers and retailers, and the high cost of food. Although their consequences are important for consumers, *baseline standards* are not communicated to the final consumer, for example using a logo and, as such certified products do not carry a price premium (recall our earlier discussion on food safety being a prerequisite to be on the market).

### Bibliographical reference

WTO (2005). *World Trade Report: Trade, Standards, and the WTO*. Geneva.

*Assurance standards* were introduced to ensure consumer confidence attributed to an environment characterized by rising consumer expectations regarding food attributes (as discussed in Module 2). These private standards are introduced as a way of differentiation of supermarkets in an increasingly competitive retail environment and are communicated to the consumer.

The *1990 UK Food Safety Act* changed the basis of food law from strict liability to a recognition that incidents can and do happen regardless the manufacturer's diligence. All fresh produce sold in unpackaged form is considered to bear the brand of the retailer. Thus, if the manufacturer demonstrates that all reasonable precautions have been taken and all due diligence was applied to prevent food safety wrongdoing, the courts will accept it as a sufficient defence. The EU General Food Law explicitly compels food companies to develop their own food safety and traceability mechanisms such as the HACCP.

### **Bibliographical reference**

Fulponi, L. (2007). "The globalization of private standards and the agri-food system". In: J. F. M. Swinnen (ed.). *Global Supply Chains, Standards and the Poor: How the Globalization of Food Systems and Standards Affects Rural Development and Poverty*.

Under EU Food Law, retailers and brand owners have a legal responsibility for their brands. In addition, unbranded food, such as meat, fruit and vegetables are considered to be sold under the retailer's brand and thus the retailer is responsible for their safety. They also happen to be food groups that most sensitive to outbreaks of foodborne diseases.

Examples of retailer schemes designed in response to food law include:

- **British Retail Consortium (BRC).**
- **International Food Standard (IFS).**
- **Safe Quality Food (SQF) Program**, an integrated food safety and quality management protocol based on Codex Alimentarius HACCP Guidelines.
- **Dutch HACCP** for food safety management.
- **ISO 22000**, which has been developed in close collaboration with the Codex incorporating the HACCP principles and covering requirements of key standards developed by various global food retailer syndicates.

## **12.1. Differences between public and private standards**

In this part, we highlight conceptual differences between public and private standards:

- Public standards can be mandatory or voluntary.

- Private standards are by definition voluntary.

Some claim that various standards, such as **GlobalGAP**, are becoming *de facto* mandatory requirement to be on the market as an increasing share of agri-food businesses in the EU requires private certification from their suppliers, placing a burden in particular on small producers.

Although some private standards could include stricter *targets*, for example, tighter levels of residue limits or zero tolerance, often the level of the private standard coincides with the level of the public standard, but the more crucial difference lies in the management system accompanying private standards. The private schemes serve as mechanisms ensuring suppliers met specific product and process specifications and to provide proof of compliance through certification, generally by a 3rd party. Different types of certification requirements exist. Some of them will be discussed in this chapter, others in the next one. A challenge in meeting the certification obligations of small producers is the cost of certification by a third party, although certification costs are based on company size and complexity of operation. Costs are estimated to lie somewhere between 1,000 euros to 2,500 euros for an annual audit of 1–2 days.

Just as there is room for harmonization of other standards, there is also room for the harmonization of certification schemes behind private standards. A supplier, unless it sells to a single buyer or all his buyers subscribe to the same certification scheme (a *private standard*), could be faced with a challenge of having to certify to several different schemes. Actual requirements of many schemes could be overlapping (such as each requiring an application of good agricultural practice), but each requires its own certification and audit. Some certification bodies offer auditing packages in which audit packs are combined. The Global Food Safety Initiative has attempted to simplify it by introducing a benchmarking process which many, but not all, big retailers recognise.

The following table illustrates the overlap between schemes:

	<b>BRC</b>	<b>IFS</b>	<b>ISO 22000</b>	<b>HACCP</b>
BRC	X	90%	60%	100%
IFS	90%	X	60%	100%
ISO 22000	60%	60%	X	100%
HACCP	100%	100%	100%	X

Source: INTEGRA (<http://trust.taftw.org.tw/doc/prod/prod8.pdf>)

#### Bibliographical reference

(Henson, 2006)

#### Bibliographical reference

[http://ec.europa.eu/agriculture/quality/policy/com2009\\_234/ia\\_annex\\_d\\_en.pdf](http://ec.europa.eu/agriculture/quality/policy/com2009_234/ia_annex_d_en.pdf)

The already mentioned GlobalGap (formerly known as EurepGAP) is already a result of harmonization between different retailer standards for good agricultural practices run by a private sector body initially established by a group of European food retailers. It aims to establish one standard for GAP (Good Agricultural Practice) with different applications. GlobalGap covers production from inputs until it leaves the farm gate. As a business-to-business standard, it is not visible to final consumers. Certification is carried out by more than 120 independent and accredited certification bodies in more than 85 countries. As of July 2008, around 92,000 producers worldwide have been certified to the GlobalGAP standards or benchmark schemes.

National types of certification are the **UK Red Tractor Mark and Qualität und Sicherheit** in Germany. The Union flag in the Red Tractor logo provides an independently verified consumer guarantee that the product comes from a UK farm.

The **Global Food Safety Initiative (GFSI)** was set up by the International Food Business Forum to promote convergence between food safety standards. **BRC, IFS, Dutch HACCP** and **SQF** are all recognised GFSI standards. Benchmarking allows major retailers to accept audits against any of these standards.

## 12.2. Implications

Private standards are examples of vertical integration of a food chain requiring extensive monitoring and resulting in deeper contractual arrangements. Consumers are usually not affected, especially those that are not communicated to them, although they could experience higher prices as a result of liability and assurance schemes adding to costs. However, certification schemes also reduce transaction costs, limit the substandard deliveries and facilitate technology transfer although the degree of pass-over is not clear.

Small producers unable to comply with certification and audit costs could be excluded from the markets where certification became a *de facto* business requirement (the part of private standards that is most often criticized and will be discussed in case studies), and consumers would suffer from a loss of variety.

Studies conclude that without external support, small scale growers are unlikely to be able to afford certification and auditing. Agrifoodstandards.net lists that in Kenya, the cost was given as 636 GBP to certify and 175 GBP to maintain it. The cost in Zambia was much higher: 4663 GBP for the initial investment and 938 GBP to maintain it. To break even in Uganda, farmers would have to increase production by 0.1 to 0.3 acres to compensate for the additional costs.

### Bibliographical reference

European Commission (2009b). "EU Agricultural product quality policy: Impact Assessment". *Annex d, certification schemes for agricultural products and food-stuffs*.

Private standards as business to business standards could become a *de facto* mandatory requirement to be on the market where buyers are concentrated and exercise market power. As private standards are not backed by governments, a grey area exists as to whether they could be disciplined in the WTO. A group of developing countries brought a complaint about private standards to the WTO SPS Committee, claiming that private standards are disadvantaging their producers focusing on market access, the development and cost of complying with private standards, and WTO law. Opinions differ as to whether private standards are in compliance or violation with the WTO requirements. In addition, the WTO is an organization of countries, represented by their governments, and does not represent its firms. Some argue that governments are responsible for the standards set by their private sectors which might not satisfy the WTO requirements of transparency, scientific justification, and could be perceived as more restrictive than necessary. An additional challenge is presented by the SPS being tailored to meet only sanitary and phytosanitary measures, while private standards can include other concerns, such as social and environmental. While standards and regulations can facilitate trade by ensuring a controlled quality for processors and by increasing consumers' confidence, it has been acknowledged that they sometimes also act as trade impediments and can be used for protectionist purposes.

Recommendations included providing better information to farmers, increased participation of developing country stakeholders in the standard setting process, and increased capacity building.

No doubt farmers would benefit from greater harmonization and mutual recognition among liability and assurance schemes.

In addition, fears about private standards are further multiplied by the concentration in the retail sector, measured by the combined market share of the top 5 firms. For example, in Germany and the UK over 70% of the market is controlled by the largest 5 firms. While the share is lower in other EU Member states, market concentration is increasing. Agricultural production, on the other hand, remains characterized by smaller operators, in particular in developing countries. Farmers usually form cooperatives and associations to improve their bargaining power, although the responsibility to certify remains at the farmer's level.

Certification does not only affect farmers but also the rest of the supply chain, such as processors, traders and retailers who have to be certified as well.

Retail private standards are not only imposed in developed countries. Supermarkets are on the rise also in many developing countries, partially driven by foreign direct investment on the supply side. However, the demand side of increasing urbanization and the rising middle class also plays a role.

### Bibliographical reference

(OECD, 1999)

### 12.3. Case studies on private standards

As an activity, read the case study:

**Bibliographical  
reference**

[http://www.oilis.oecd.org/  
oilis/2006doc.nsf/NEWRM-  
SENGREF/NT0000942A/  
\\$FILE/JT03230765.PDF](http://www.oilis.oecd.org/oilis/2006doc.nsf/NEWRM-SENGREF/NT0000942A/$FILE/JT03230765.PDF)

