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ECO-LABELLING STRATEGIES AND THE GREENING OF THE FOOD MARKET

1. Introduction

Special rules concerning voluntary environmental label schemes have already been established in many countries, such as the German Blue Angel label, the Nordic White Swan, the US Green Seal, and the eco-label of the European Union, the Euro-flower. The special "Life Leaf" label was recently introduced in St. Petersburg, Russia and an eco-labelling scheme and rules were developed. The eco-labelling project was launched in the city by a non-governmental organization, the St. Petersburg Ecological Union.

Within this scheme, environmental criteria were developed for evaluating the environmental quality of meat products, from "less discharges of toxic and polluting substances into water, soil and air" to special sanitary hygienic requirements for the production process, the chemicals used, and sustainable farming. Currently, the project aims at developing criteria of ecological quality for baked goods and bottled drinking water.

The successful implementation of an eco-labelling project depends not only on the willingness of producers to strive to be awarded the eco-seal, but also on consumer interest in and awareness of environmentally safe products. Research on consumer preferences showed that poor environmental consciousness could slow the greening process of the food industry. Therefore, additional attributes of eco-labelled food are needed for their successful marketing. This paper presents some notes on key issues affecting the greening of the food market in Russia.

2. Rationale of the Eco-labelling Project in St. Petersburg

At present the food industry is among the most dynamic branches of the Russian economy, providing various products for people's daily consumption. Starting production of a new product does not necessarily mean that new energy- and resource-conserving technologies are going to be used. Therefore, energy and resource savings are becoming crucial. Also, special emphasis should be given to safety and especially the environmental aspect of food, as its hygienic cleanliness directly affects the health of consumers. Usually, by the term "safety" we understand the absence of toxins, carcinogens, and other negative influences on humans, assuming consumption does not exceed normal daily amounts.

The concept of environmental safety is wider and covers not only conventional food safety, but also the safety of the raw materials used in production, the environmental impact of production itself and the storage and utilization of wastes. To confirm that a company is concerned about its consumers, the quality of its products and the environment, it can launch a voluntary eco-labelling process in addition to the certification that is mandatory for food products.

The Russian market is only now about to realise the potential of environmentally friendly products. Until recently there were no schemes for analysing whether products were "green" or not. A national system of eco-labelling was introduced in 1999, based on ISO 14041 requirements. However, it was abandoned due to a lack of interest and support on the part of industry and the public. Only in 2001 did this system begin operating again, when the St. Petersburg Ecological Union, with the support of the St. Petersburg Chamber of Commerce and Industry and the city administration, initiated a project to develop an eco-labelling scheme for food products. For the first time in the history of environmentally safe production, the "Life Leaf" eco-label was introduced and officially registered as a trademark. Eco-labelling aims at establishing a public eco-labelling system as a procedure that ensures that this special symbol is awarded only to environmentally friendly products and goods.

The food and food processing industries based in St. Petersburg are steadily expanding. In 2001, their contribution to the industrial output of the city reached 40%. The most significant sectors of the St. Petersburg agricultural industry complex (AIC) are beer and alcohol-free beverages (32%), tobacco (11%), baked goods (10.5%), fats and oils (8%), dairy (8%), and flour and cereals (6%). In 2001, the city's AIC output increased by 15% compared with 2000, nearly twice the average increase in Russia (8%). The AIC includes 86 large and medium-size companies that cover 23

branches of industry. About 25% of these food products come from small business [Shirokov, 2002] and the number of small and medium-size companies is increasing rapidly. However, new production facilities do not necessarily use new environmentally friendly technologies.

The city has continued cooperation with the Leningrad Oblast (Region) under an existing bilateral agreement. According to recently published data, the Leningrad Oblast provided St. Petersburg with 100% of its dairy products and eggs, 70% of poultry, 60% of vegetables, and 30% of potatoes. The retail market in 2001 was steady and sound, without any dramatic fluctuations. The domestic share of total food sales was 80%, and the local contribution in some sectors exceeded 50% [Petrov, 2002]. The extent of market saturation with commodities approached 100%, which may soon lead to sharp competition.

Everyone agrees that special emphasis should be given to the quality of food produced, and the city government pays special attention to issues associated with environmental quality, which has become a keynote of the consumer market. Both consumers and producers face the challenge of ensuring the quality of food, especially regarding its environmental safety.

Though it may seem paradoxical, growing interest in environmental quality is a sign of economic well-being, because it is in the developed countries that people pay attention to what they eat, drink, breathe and use. The founders of the St. Petersburg Ecological Union consider that environmentally friendly business could become a present-day reality, since the psychology of modern Russian consumers has changed in recent years. Now they are ready to buy more expensive goods and foods in lower quantities, but of better quality healthier and safer. Therefore, besides educational activities, the Union formulated its new goal – to unite all its efforts and to link consumer preferences with producer readiness to satisfy them [Gordyshevsky, 2002a].

3. Current Trends in Eco-labelling

Eco-labelling should comply with ISO 14024 requirements. One can use the label only after voluntarily submitting one's environmental and quality performance to comprehensive evaluation. The procedure should be transparent and open to the public [Gordyshevsky, 2002b]. The objectives of the project are the same as those already established in different countries:

- ensuring the product's safety at all stages of its life cycle,
- suspension or stoppage of sales of products that do not fulfil the environmental requirements established,

- help in selling goods with the best environmental characteristics,
- evaluation of production waste from the point of view of its environmental safety and possibilities for further utilisation.

There is another important feature that distinguishes the St. Petersburg project: product safety is considered in terms of both consumer health and environmental safety.

The following steps should be undertaken within the framework of the project:

- selecting a category of products whose production process is responsive to suggestions from industry, environmentalists, consumers and other interested parties,
- assessing the environmental impact of products in the product category by life-cycle analysis (LCA),
- setting criteria and thresholds for awarding the eco-label,
- reviewing the product category and criteria.

Since 1991, the St. Petersburg Ecological Union has operated as a non-governmental organization. It was organised primarily as a union of environmental cooperatives, and in 2000 it became a non-profit and non-governmental organization. At first the union was occupied mainly with disseminating information and educational activities. The next step was drafting and approving the "Ecology and Human Beings Program," aimed primarily at developing an ecological culture through the practical solution of specific tasks. Within this project the union started working with companies orientated towards environmentally safe business and continues to look for ecologically orientated companies.

By analogy with the procedures used in the certification of environmental management systems or certification of environmental laboratories, the general principles in certification are as follows:

1. The company applies for the awarding of the eco-label to a product or product group.
2. The union seeks an expert or organization that has the relevant expertise and can develop a methodology for the eco-labelling.
3. The advisory board confirms the draft methodology, if there are no amendments needed and all the parties have approved it. The Board consists of representatives of the city administration and its committee on natural resources, environmental protection and provision for ecological safety, as well as the St. Petersburg Chamber of Commerce and Industry and representatives of the organizations involved, well-known academics, and experts.
4. When the methodology is available, a consultant is accredited to perform an evaluation of the production chain through a complete or partial LCA, and guarantees that the LCA meets the requirements or

criteria listed in the methodology. This procedure is similar to that of an accredited laboratory that carries out chemical analyses and guarantees that the analyses were done according to specific standards.

Independent validation, *i.e.*, the quality assurance procedure, is important in order to achieve high reliability in the eco-label labelling scheme. ISO requirements include certification and accreditation as optional possibilities.

Accreditation and certification may be components in the quality assurance procedure of an environmental labelling project in the later stages, since in St. Petersburg there are currently no national accreditation organizations able to carry out certification processes in accordance with the ISO 14024 standard. Therefore, the certification of a Type III environmental declaration remains an option that could increase the credibility of the eco-labelling scheme. A Type I eco-labelling program is currently being considered: a voluntary procedure undertaken by an independent third party that leads to the issuing of a license confirming an organisation's or company's right to put an eco-label on its products or packaging [Bougherara and Grolleau, 2003].

St. Petersburg State University of Refrigeration and Food Technology plays the role of the methodology developer for food products. It was founded in 1931, and since then has become a leading institution in the field of food technology and engineering. Each year the university trains 5000 students in the following areas: heat and power engineering and energy efficiency; machinery and equipment; automation; food technology; biotechnology, microbiology, economics and business; industrial ecology; cryogenic machinery, air conditioning, and life support systems. The University consists of 32 departments and 6 faculties. The full-time faculty members and staff number 353, and over 80% of the academics have doctorates or higher academic titles, and more than 40 staff members are fellows of academic organisations, corresponding members or academic consultants of the International Academy of Refrigeration, the International Academy of Higher Education, the Engineering Academy or other scientific organizations.

To increase the degree of independence, the development of eco-labelling methodology should be done by one organisation or person and verified by another certified (or accredited) organisation or person. Therefore, independent institutions such as environmental auditors and accredited environmental laboratories are needed. Accredited laboratories and certified experts from the St. Petersburg Chamber of Commerce and Industry take part in the eco-labelling project. Thus, third party verification by an institution approved by the program developer is realised.

4. Eco-labelling from the "Eco" Point of View

The general principles or requirements of the ISO standards should be followed as far as possible in the eco-labelling program. These standards guarantee that the same basic principles have been followed in the carrying out of the LCA for all product groups and service types, even though the standards allow certain flexibility, such as in the definition of system boundaries.

An important part of the eco-labelling procedure is data verification. The data required is defined in the methodology.

The leading principles of the eco-labelling project are as follows:

- The methods used should be scientifically and technically valid.
- The data used should be appropriate and reasonable in relation to the goal of the study.
- Interpretations should reflect the limitations of the methods used and the goal of the study.

The development of the methodology must be seen in light of the overall goal of a product-oriented environmental strategy: to strengthen competition among different producers based on eco-efficiency. This goal can be achieved by improving access to a producer's environmental data.

The criteria of eco-labelling must be based on estimates of the environmental impact at all stages of the product's life cycle. Careful study of life cycle stages permits us to define criteria for environmentally dangerous factors. If the quality of the goods corresponds to the established criteria, then the goods may carry an eco-label.

The proposed elements of the scheme include:

- control of material flow, record-keeping, etc. at the production site,
- control and selection of data,
- control and fulfilment of the general requirements of the eco-labelling methodology.

5. Methodological Aspects of the Eco-labelling Project for Food Products

Specific sections in the methodology for certified products may differ when comparing two products or services even within the same product group. Therefore, it may be necessary to prepare different methodologies from case to case. The term "product group" has been used to clarify that the requirements concern a group of products, not just a specific product.

Within such a scheme, experts from the St. Petersburg State University of Refrigeration and Food Technology began to elaborate an eco-labelling methodology for meat, baked goods and bottled drinking water.

Thirteen environmental criteria were developed for the evaluation of the environmental quality of meat products, from "less discharges of toxic and polluting substances into water, soil and air" to special sanitary requirements, to the production process, use of chemicals and sustainable farming.

The first experience with the method at a St. Petersburg meat processing plant involved the company's application to be awarded the eco-label. The list of criteria for meat products and assessment of the company's compliance are shown in Table 1. The score for each criterion was determined on the basis of a national standard of requirements for the quality of conventional food products and environmental quality and safety. The overall score was calculated by multiplying the scores awarded for the listed criteria. To be awarded the eco-label, the overall score should be as high as possible, and no less than 0.6. Despite the high conventional product quality, this producer could not guarantee the ecological quality of the product and therefore was not awarded an eco-label.

Table 1. Criteria for the eco-labelling of meat products, and scores assigned in one example

Criterion	Identification	Score
Quality of raw material	C ₁	1
Use of non-food waste	C ₂	1
Production waste	C ₃	1
Use of chemical substances	C ₄	0.8
Conditions of production	C ₅	1
Emissions into the atmosphere	C ₆	0.8
Fresh water consumption	C ₇	1
Wastewater cleaning system	C ₈	0.97
Energy use	C ₉	0.88
Quality of end products	C ₁₀	1
Packing	C ₁₁	1
Sanitary and hygienic measures of the enterprise	C ₁₂	1
Environmental information and education of the personnel	C ₁₃	0.75
Overall Score	C ₀	0.41

Source: Authors' own elaboration.

This example demonstrates that the strict definition of eco-labelling criteria imposes technical limitations on a company, even though it is strong with regard to conventional production criteria.

6. Eco-labelling from the “Behavioural” Point of View

Manufacture of ecologically safe products demands additional expenditure on preventive action and certification. As a result the price of “green” food can be considerably higher than that of “conventional” food. Therefore, at the stage of production planning it is advisable to carry out preliminary marketing research: analysing the market for ecologically safe products and studying consumer preferences and their readiness to pay higher prices for additional ecological quality.

Most green marketing literature is strongly based on the assumption that consumers’ environmental awareness is a pre-condition for green purchasing [Meyer, 2001; McGarry Wolf et al., 2002; Renck, 2002]. Researchers have generated a demographic profile of purchasers of organic and non-organic food and examine behaviour, familiarity and attitudes towards eco-labelling. Some surveys show the importance of the level of label detail in determining whether a consumer purchases the eco-labelled product. Higher product cost, little choice and complexity of information are considered as barriers that need to be overcome in the successful marketing of green products.

The successful implementation of an eco-labelling project depends not only on the eagerness of producers to be awarded with the eco-label and consumer interest in and awareness of environmentally safe products, but also on finding a product’s value added that may be gained by implementing an eco-labelling scheme in companies. The additional value of green products could serve as a basis of a marketing strategy and will depend on the peculiarities of customers, countries and economies, as well as the type of commodities to be labelled.

A pilot investigation on consumer attitudes towards environmentally safe baked goods was undertaken within the eco-labelling project. The research method was based on a public opinion survey. The study had several aims: to determine how the maximum prices consumers were willing to pay for environmentally safe products were correlated with their family income, sex, and age; to evaluate consumer understanding of the term “ecological quality” of products; and to learn consumer preferences regarding information sources related to environmentally safe products.

The study was intended to test the following hypotheses:

- The segment of the population most prepared to pay more for environmentally safe products is people with high incomes, mainly middle-aged women with higher education.
- Consumers are not sufficiently ready for an increase in the price of eco-labelled products.

– Consumers do not know what the “ecological safety” of a product means and associate it only with a product’s quality and safety regarding health, *i.e.*, with conventional food safety.

The data were collected using a specially prepared questionnaire. Visitors at a St. Petersburg supermarket and students at St. Petersburg State University of Refrigeration and Food Technology were chosen as respondents. Data from a sample of 150 people were used; therefore the research should be considered as a pilot study whose conclusions are only rough.

7. Results of the survey

The respondents’ social-demographic characteristics are shown in Table 2.

The relationship between the level of family income and readiness to purchase eco-labelled baked goods is shown in Figure 1. The most active

Table 2. Social-demographic characteristics of respondents

Characteristic	Respondents (%)
1. Sex	
Female	62
Male	38
2. Age	
Less than 28	61.6
28–40	12.8
over 40	25.6
3. Family Income, RUR/month	
Below 5,000	29.4
5,000 to 7,000	23.5
7,000 to 10,000	21.2
10,000 to 15,000	14.1
15,000 to 20000	4.7
above 20 000	7.1
4. Level of Education	
Secondary school	17.7
Vocational education	16.5
Higher education	65.8

Source: Authors’ own research.

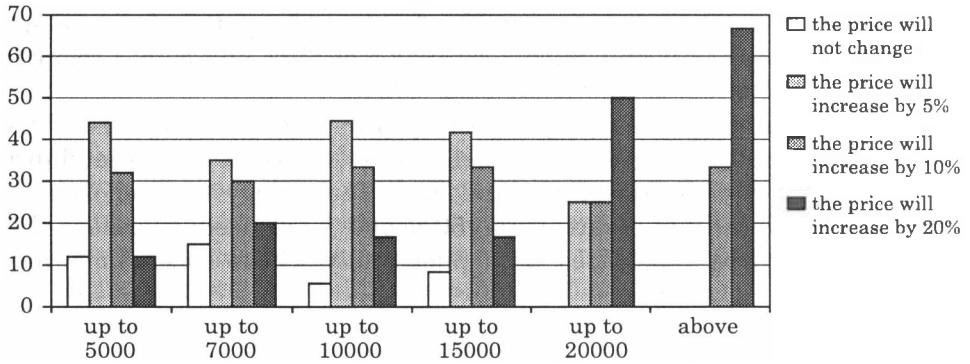


Fig. 1. Relationship between the level of family income and readiness to buy more expensive eco-labelled bakery goods

group of buyers – women up to 28 years old – are prepared to buy environmentally safe bread, if its price is 5% higher than conventional bread, whereas men of the same age category are willing to pay much more under the same conditions (Figure 2).

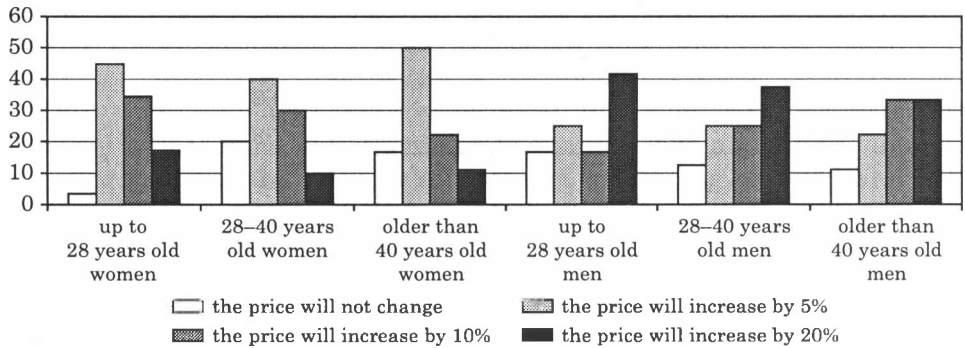


Fig. 2. Relationship between sex-age characteristics and readiness for a price increase

For the largest group of respondents (45%) the highest acceptable increase in the price of eco-labelled products is 5%, compared with about 12% prepared to purchase such products only if their prices are the same as those of conventional goods (Table 3). There also is a segment of buyers (7% of all respondents) prepared to buy these products at any price. A total of 88% of respondents are prepared to pay at least 5% more for eco-labelled bread and other baked goods, in some cases considerably more: the 7% most environmentally concerned said they are prepared to buy such products at any prices.

Table 3. Consumer acceptance of a price difference between eco-labelled baked goods and conventional goods

Acceptable price difference	% of sample
None	12
5%	38
10%	22
20%	21
Any	7

Source: Authors' own research.

The respondents were asked to choose from a list the characteristics that in their opinion characterize ecologically safe products. The answers included both traditional characteristics of quality and environmental ones. As is shown in Table 4, two environmental aspects were not taken into account by at least half the participants: whether the packaging is biodegradable and whether harmful substances were formed during production. More than 50% of the respondents in each age group selected "safe for health" and "no toxic materials used in manufacture". Besides characteristics of environmental quality, they also frequently mentioned characteristics related to traditional concepts of quality.

Table 4. Respondents' association of various characteristics with the notion "Environmental Quality of a Product"

Characteristic	Respondents (%)
1. Environmental Quality	
No harmful substances formed during manufacture	43.8
Safe for health	60.7
No toxic materials used in manufacture	58.4
Grain comes from environmentally clean areas	58.4
Biodegradable packaging	38.2
2. Conventional Quality	
Beneficial for health	51.7
High quality flour and water used	48.3
Does not contain preservatives or artificial additives	51.7
Does not contain genetically modified products	34.8
Tastier than other kinds	16.9

Source: Authors' own research.

The research was also aimed at revealing the best communication tools for "green" marketing. Respondents were asked to select their preferences from the most widespread sources of information: 1). A special label on the package; 2). Advertising in shops; 3). Mass media (newspapers, magazines, radio, TV), and 4). Poster advertising (e.g., on transport, highways).

The most informative sources for consumers of baked goods are a special label on the package (noted by 40% of respondents) and poster advertising (14%) (Table 5).

Table 5. Consumer preferences regarding sources of information about eco-labelled products

Information source	Respondents preferring (%)
Special label on package	40
Advertising in shops	9
Mass media	5
Poster advertising	14
Label + advertising at shop	9
Label + poster advertising	9
Label + mass media	5
Mass media + advertising in shop	9

Source: Authors' own research.

Summarizing the results of the survey, we conclude that:

- Respondents are not informed enough about ecologically safe production. They do not distinguish notions of environmental and conventional food quality. The predominance of health and safety aspects seems clear.

- Attracting consumer attention to and demand for eco-labelled food requires raising the level of consumer knowledge about ecological quality. Large-scale advertising, educational effort and special labels on packages are needed.

- The majority of respondents are not prepared to accept a price difference of more than 5% between environmental and conventional products and a significant portion refuses to pay any higher price for environmental products.

- The largest group, women up to the age of 40, regardless of income, agree to a price difference of only 5%, although they are the most active

and informed segment of consumers. Therefore, the first hypothesis was not confirmed.

– 81% of consumers consider the acceptable price increase to be between 5% and 20%; only 7% are interested in purchasing “green” bakery products regardless of price, while price is the overriding consideration for 12%.

8. Conclusions

The objective of environmental labelling is to permit consumers to choose those goods that impose the least harm on the natural environment. It also is intended to stimulate producers to make environmentally safe products. Eco-labels could be considered a way to gain a “green advantage” in the market, if there is a demand for such products among consumers. Therefore, relevant educational programs for the public are needed and a wide range of marketing tools should be used for the promotion of “green” products.

One eco-labelling tool is a communication programme involving advertising, public relations and stimulation of sales by means of information establishing the connection between the enterprise and its environment. As activities ensuring environmental protection are costly to industry, the price of the end product is higher. This places special requirements on company marketing policies. Advertising information should emphasize the strengths of “green” products.

More likely, producers could attract the attention of St. Petersburg consumers to “green” products, if they guarantee strict standards for both conventional food quality and environmental protection. Thus, they can protect consumer rights to healthy, safe and environmentally friendly food.

Although environmental protection and preventing pollution are costly for many Russian companies, they also have a positive economic effect. Therefore, ecological and the economic results can support each other in the eco-label project.

Despite the eco-labelling process in St. Petersburg being in its initial stages, its developers hope it will be continued in the future.

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