AWARENET: Agro-Food Wastes Minimisation and Reduction Network

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Abstract

Despite of the economic importance of the food sector, during the last European Framework Programmes there has not been a global European vision addressing the environmental problems arising from agro-food wastes. AWARENET is the first network for agro-food wastes prevention, minimisation and valorisation focused on the main industrial sectors, i.e. meat, fish, dairy, wine and vegetables. 33 members – including two Newly Associated States - from 14 European countries integrate this network, co-ordinated by the Spanish Technology Centre GAIKER. The European Commission in GROWTH programme funds this initiative with a budget of 1.475 M € for three years (2001-2003).

This initiative results from the environmental issues in agro-food industries linked to the management of its emissions, especially regarding solid and liquid wastes with high organic load. The alternative of valorisation/up-grading processes for obtaining high added value compounds (proteins, oils, sugars, colorants, antioxidants...) against current destruction technologies for these wastes poses an attractive option for new business opportunities.

The main objective of AWARENET is the co-ordination of activities leading to the prevention, minimisation and up grading of agro-food wastes at an European scale. It is a discussion forum for information exchange and technology transfer which conclusions will be finally gathered in a white book for the adequate management of agro-food wastes in Europe. Its main innovation is the integration of the agro-food industrial waste problem from three different and critical points of view: regulatory issues, technology and market, with the final objective to propose a global R&D European strategy for these wastes.
1 Introduction

The agro-food sector in Europe presents a production value close to 480 billion €, higher to the one corresponding to U.S. (410 bill. €) and much higher than the Japanese one (170 bill. €). During the 80’s the higher enterprise participation within this sector in Europe was the one of multinational companies. However a significant number of SMEs contribute to employment in the sector, that in 1997 counted for 8% of European industrial employment.

Due to the characteristics of the companies of this sector (great number of companies with less than 20 employees) and the trends in these last years (improvement in the production process efficiency) not too much effort has been put in solving their environmental issues.

One of the most important environmental problems of the agro-food sector is the high organic content of its effluents and residues, which implies a high treatment cost. However, these effluents and residues have a great number of organic compounds with a high nutritional value (proteins, oils, sugars, vitamins, colorants and antioxidants). The minimisation and valorisation of these wastes has a double advantage: reduction of the polluting load of agro-food industries and contribution to the sustainable development of the agro-food sector through a rational use of the natural raw materials. It has also another important advantage: the cost saving, as the higher use of raw material in production processes implies a reduction in the amount of it needed, and a decrease in waste disposal taxes.

Despite of the economic importance of the food sector, during the last European Framework Programmes, there has not been global European vision addressing the environmental problems arising from agro-food wastes. Thus it was considered suitable and necessary to propose AWARENET, a thematic network for agro-food wastes prevention, minimisation and valorisation issues at a European scale focused on the 5 main agro-food industrial sectors: meat, fish, dairy and agro-products including wine and vegetables. The innovation of AWARENET lies on the integration of the agro-food industrial waste problem from the three different and critical points of view: regulatory issues, technology and market, with the final objective to propose a global R&D European strategy for agro-food industrial wastes.

Currently AWARENET counts with the participation of 33 members, including companies generating or up-grading agro-food wastes, equipment manufacturers, consultancies and technology centres and Universities from 14 different European countries (Portugal, Spain, France, The Netherlands, Belgium, United Kingdom, Sweden, Finland, Denmark, Germany, Italy, Poland, Hungary and Greece). Besides, it counted with the participation with an Irish member for the first year, and has potential dissemination to other countries such as Austria and Luxembourg by current members. In other words, the European representativity of the consortium is proven.
2 Objectives

The main aim of the AWARENET thematic network is to co-ordinate, at a European level, activities for the prevention, minimisation and valorisation of agro-food wastes in the companies within this sector. For this purpose the exchange of experiences and technology transfer within the members of the consortium is foreseen to define a white book comprising the results obtained available for any interested party in agro-food waste issues.

2.1 Scientific and technological objectives

- To define the current situation of agro-food industries waste generation, treatment and management at European level. Due to the wide diversity of the sector, AWARENET work will be focused in five main and more representative sectors: diary, meat, fish, wine and vegetable.
- To identify technologies and methodologies allowing the minimisation and valorisation of agro-food wastes within the production processes.
- To identify the market demand for existing or new products from valorised agro-food wastes.
- To link the environmental requirements of the European regulations for the agro-food industries with the market demands for valorised products from agro-food by-products.
- To define the R&D needs for improving actual agro-food wastes minimisation and valorisation.
- To propose an integrated European strategy compiling the conclusions of the three working Areas (regulatory issues, technologies and market) in the field of agro-food wastes minimisation and valorisation.

2.2 Environmental objectives

- To provide tools to European agro-food industries to reach the zero-waste production processes.
- To help the European agro-food sector to adapt to the European environmental regulations that give priority, in this order, to the prevention, minimisation and valorisation of wastes prior to their safe elimination and disposal.

2.3 Social and economic objectives

- To promote the sustainable development in the agro-food sector through a more rational use of the natural raw materials.
- To record and disseminate to the European Community the results of the assessment of the initiatives existing through Europe, information almost entirely absent at the moment.
To reach these objectives, AWARENET aims at the fulfilment of activities in four main Areas:

- **Legislation**: gathering of information on the current environmental situation of agro-food wastes, presentation in a fashionable and useful way the environmental legislation related to these wastes and realisation of an inventory of agro-food wastes in Europe.
- **Technology**: identification of critical points giving rise to agro-food wastes in the main production processes of the five target industrial sectors, evaluation of current practices for waste minimisation and upgrading in SMEs, identification of best available technologies and equipment currently available and disseminate the obtained results in a "white book" for minimisation of agro-food wastes.
- **Market**: identification of the requirements and/or market opportunities for already existing or novel products from agro-food wastes and picking out by-products potentially interesting for up-grading considering a waste minimisation strategy.
- **European RTD strategy**: summary of AWARENET activities to propose a global European strategy for agro-food wastes based on their minimisation and up-grading.

3 AWARENET Workplan

AWARENET, the Thematic Network for agro-food waste minimisation and reduction funded by the VFP Growth programme has an overall duration of 36 months, having started its activities by January 2001.

It is co-ordinated by GAIKER (Spain) and counts with a steering committee formed, apart from the general co-ordinator, with two consultancies (ADAS and CIMA, from United Kingdom and Italy, respectively) and a technology centre (TTZ from Germany), being each one of them area co-ordinators. Figure 1 shows the countries participating in AWARENET and the communication flux within the consortium.

The activities to be accomplished during the whole project are divided in 7 Workpackages (WP) that comprise the four working areas to achieve the proposed objectives. The seven WP referred to their corresponding execution years have been planned as follows:

**Year 1**: Diagnosis of the current situation of agro-food wastes in Europe
- WP1: Analysis phase (network constitution)
- WP2: Defining of European issues on agro-food industrial wastes

**Year 2**: Definition of agro-food wastes prevention and minimisation tools and market study for new products.
- WP3: Tools for prevention and minimisation of agro-food wastes generation in the European industries
- WP4: Market for new products and technologies for agro-food valorised by-products
Year 3: Definition of best available technologies (BATs) for minimisation and upgrading of agro-food wastes and proposal of a European RTD global strategy.

- WP5: Evaluation of the best practices and technologies for the minimisation and valorisation of agro-food by-products in the producing industries
- WP6: Development of a proposal of a global European strategy for agro-food industrial wastes

The last Workpackage (WP7) deals with project management and dissemination of results during the whole project.

PARTICIPATING COUNTRIES AND COMMUNICATION FLOWS

Figure 1. AWARENET participating countries and communication flow

4 AWARENET: Results of Phase 1

During the first year of the project, topics from three different areas (legislation, technology and market) and five industrial sectors (meat, fish, dairy, vegetable and wine) have been approached, specifically:

a) The European and national (from the different participating countries) environmental legislation related to agro-food wastes has been gathered, identifying as most outstanding directives the following ones: 90/667 on disposal and processing of animal waste, 91/271 on urban waste-water
treatment, 96/61 on integrated pollution prevention control (IPPC) and 99/31 on the landfill of waste,

b) A preliminary inventory of wastes from the five industrial sectors evaluated has been outlined, starting from official production data from Eurostat and defining the main solid and liquid wastes generated in the different production processes both quantitatively and qualitatively (amounts and waste types). Currently a software/database for an adequate management of compiled data is being developed (AWARENET database) to answer the potential queries regarding the agro-food waste situation in Europe,

c) The main production technologies in the five different industrial sectors (1-2 per sector) have been identified, defining current minimisation and waste management practices and, lastly,

d) The main commercial products from agro-food wastes have been listed so as the basic tools to be used by the market area during the project

These results have been gathered in the corresponding deliverable reports to the Commission, of internal use within the consortium. They are just preliminary documents to be used as starting point for the activities to be accomplished during this second year, basically referred to the technology area (identification of critical points giving rise to organic wastes in food processing and prevention, minimisation and valorisation technologies) and market area (market for new products and minimisation/upgrading technologies). The final results and conclusions will be available for public consultation in the white book to be printed at the end of the project.

5 Dissemination of results

One of the main objectives of AWARENET is the dissemination of results coming from this discussion and information exchange group. Concerning this, there are currently two communication ways for all those interested in this subject. On one side, it is possible to access to the AWARENET interest group in the web page (http://ew.eea.eu.int) allowed by the EnviroWindows service of the European Environmental Agency (EEA) In this address, apart from AWARENET general and member specific information, it is possible to download public documents related to agro-food wastes. On the other side, there is a project publication (AWARENET Newsletter) every six month that already counts with two numbers. This Newsletter can be either downloaded from the web page or sent by mail prior request to the general secretary of AWARENET in awarenet@gaiker.es.