COMMISSION OF THE EUROPEAN COMMUNITIES

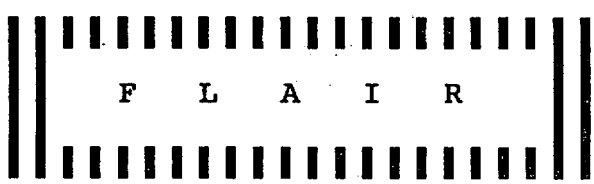
COM (88) 351 final - syn 140

Brussels, 24 June 1988

PROPOSAL FOR A COUNCIL DECISION

TO ADOPT A MULTIANNUAL RESEARCH AND DEVELOPMENT PROGRAMME

IN FOOD SCIENCE AND TECHNOLOGY (1989 to mid-1993)



(Food-Linked Agro-Industrial Research)

(presented by the Commission)

COM-351

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SUMMARY

It is intended to pursue the objectives of the Framework programme, action line 4.2 ("agro-industrial technologies") through two complementary Community initiatives. The first proposed programme "European Collaborative Linkage of Agriculture and Industry through Research" (ECLAIR), aims to improve collaboration between the agricultural and industrial sectors through R&D developments, based on recent progress in the life sciences and biotechnology.

The second proposal "Food-Linked Agro-Industrial Research" (FLAIR) presented here, concentrates exclusively on the food sector and particularly on the processing-distribution-consumer end of the food chain. In this programme, research on the quality and competitiveness of food stuffs and on nutritional and toxicological properties will be supported, as specified in the Framework Programme. The proposed programme builds on the past experiences and successes of programmes COST90, 91, 90bis and 91bis.

This multi-annual programme has 3 sectors. Within each sector, cost-shared and concerted actions will be carried out where each is most appropriate. Furthermore, in each sector, grants may be awarded for training and mobility, to facilitate the assembly of relevant skills and the diffusion of results. The proposed programme content is as follows:

The Assessment and Enhancement of Food Quality shall consist of research and development on:

- quantitative measures of "quality";
- objective organoleptic and sensory criteria and their relationship to quality;
- quantitative measures of "freshness" of processed foods;
- the characteristics of raw materials as they affect processing and end product quality; and
- new technologies and processing innovations which enhance food quality while also facilitating processing, and the building of consumer confidence.

Food Hygiene, Safety and Toxicological Aspects shall consist of research and development on:

- improved rapid screening tests to predict potential toxicity factors;
- the occurrence of natural plant toxins and their effects on food;
- predicting microorganism growth rates, accelerated methods for specific organisms and total counts;
- improved understanding of the relationship between food constituents and food allergies (immunogenic properties); and
- the application of these tests in food processing and new food

product development to ensure the safety of both processes and product.

Nutrition and Wholesomeness Aspects shall consist of research and development work on:

- new processing techniques, applications and natural ingredients which provide high nutritional and wholesomeness values;
- the bioavailability of the nutritional constituents (e.g. vitamins and minerals) and the effects of processing, distribution, catering, storage, and home treatment;
- the nutritional and wholesomeness value of foods designed for particular uses (e.g. slimming or athletics) or important to sub-groups in the population (e.g. infants and the elderly); and
- those new processes and technologies which enhance the nutritional and wholesomeness of foods.

The FLAIR programme provides for two types of actions: concerted or coordination activities; and cost-shared projects; both of which are pre-competitive and are aimed at the interface of industry and the consumer. Through such research and development work, it will contribute in the medium and longer terms to Europe's competitiveness in the economic activities of the food industry and the harmonious development of the internal market.

Participation in cost-shared projects is open to all universities, research institutions, industrial firms established in the Member States as well as those in the non-Member (European) States which have framework agreements in S/T cooperation with the Community. Concerted actions may be under taken in a COST framework, and are therefore open to those European non-Member States which have participated in COST.

It will be recommended that universities participate with an industrial partner(s), particularly for the co-financing of the project. All projects must include participants from more than one Member State. Provisions will be made for the protection of intellectual property, where required.

The FLAIR programme is expected to commence in January 1989 and run for 4 1/2 years, with a budget of 25 MioECU, which includes a staff of 5 persons.

1. Introduction

The Single European Act[1] identifies inter alia the Community's aim to strengthen the scientific and technological basis of European industry towards international competitiveness through research, technological developments and demonstration programmes, complementing activities carried out in Member States. The proposed programme contributes towards this aim in the area of food science and technology.

Within the current Framework Programme[2] of Community activities in research and technology development, action line 4.2 ("agro-industrial technologies") seeks to provide benefits for agriculture, industry and the consumer simultaneously, in particular through the implementation of technologies based on modern concepts in the life sciences. It is intended to pursue this objective through two complementary Community initiatives. The first proposed programme "European Collaborative Linkage of Agriculture and Industry through Research" (ECLAIR)[3], aims to improve collaboration between the agricultural and industrial sectors through R&D developments, based on recent progress in the life sciences and biotechnology.

The second proposal "Food-Linked Agro-Industrial Research" (FLAIR) presented here, concentrates exclusively on the food sector and particularly on the processing-distribution-consumer end of the food chain. In this programme, research on the quality and competitiveness of food stuffs and on nutritional and toxicological properties will be supported, as specified in the Framework Programme.

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1 As stated in the Single European Act, Article 24, concerning the addition of Title VI, Articles 130 F and G to Part Three of the EEC Treaty.

2 COM(87) 516 "Council Decision concerning the Framework Programme for Community activities in the field of research and technology development (1987 to 1991)", 28 September 1987. O.J. L302, 24.10.1987.

3 COM(87) 667 final. "Proposal for a Council Decision to adopt a first multiannual programme (1988-1993) for biotechnology-based agro-industrial research and technological development", 18 December 1987.

The proposed programme builds on the past experiences and successes of programmes COST90, 91, 90bis and 91bis[4], and will include concerted as well as cost-shared actions.

2. Objectives of Proposed Programme

The objectives of this Community initiative are to promote food industry efficiency and competitiveness; to improve food safety and quality for the consumer; to reinforce the scientific and technical infrastructures serving the European food industry; and to contribute towards the harmonious realization of the internal market.

The programme aims at complementing existing food research initiatives in Member States by encouraging further collaboration between different research groups and industry. It will concentrate on the interface between food processing, food distribution and the consumer, with an emphasis on improved quality norms. In addition, the potential side-effects for agriculture and the environment will be taken into consideration.

The programme emphasis will be to maintain and enhance food quality, particularly by developing and relating objective quality and sensory assessments; to further develop food safety, hygiene and toxicology methods to ensure the protection of the consumer; to quantify the effects of various processing technologies on bioavailability and nutritional properties; and the development of a range of new or integrated technologies which enhance food quality, safety and nutritive values.

3. The Needs for Food Science and Technology in Europe

Food science and technology forms an integral part of the food system, which ranges from the producers, to processors, distributors and finally to the consumer. The European food system contributes some 10% of Gross Domestic Product[5], is structurally very complex and fragmented. In the European

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4 Council Decisions N° 78/117/EEC, 20.02.1978 (OJ N° L54 (p.25), 25.02.1978); N° 79/878/EEC, 22.10.1979 (OJ N° L270 (p.53), 27.10.1979); N° 80/179/EEC, 18.12.1979 (OJ N° L39 (p.30), 15.02.1980); N° 80/1183/EEC, 4.12.1980 (OJ N° L350 (p.54), 23.12.1980); N° 82/840/EEC 22.11.1982 (OJ N° L353 (p.25), 15.12.1982); and N° 84/304/EEC, (OJ N° L151 (p.46), 07.06.1984).

5 From: "Future of the European Food System; implications for Science and Technology", synthesis of the results of FAST II ALIM Studies. (in press).

Community, there are some 23750 food transformation enterprises[6], which employ more than 20 people each, totalling about 2.5 million. Approximately 3% of these industries are large and spend substantial sums on R&D, but the vast majority operate on a small scale and tight margins. These processors depend on national governments and research institutions to provide them with the scientific and technological support necessary to compete successfully in the market place. The food market is of a finite size, thus to improve market share, the industry is compelled to concentrate on the improvement of the quality of its products rather than the quantity; which in turn, requires a greater dependence on scientific and technological innovation.

It is estimated that Member governments may spend in excess of 500 MioECU per annum on food R&D[7]. However, the European food system is in constant change, and is an integral part of the world food market. The increasing competition and transnational trading is now on a scale beyond the capabilities of many individual national research programmes.

In recent years new dimensions have been added to the food system: the increased consumer interest and requirement for healthy, nutritious food, coupled with a demand for greater variety and hedonistic satisfaction.

Therefore, studies on food technology are complicated by the continuing changes in food production, processing, and distribution, on the one hand and changes in socio-economic and food consumption patterns and perceptions on the other. Many of these difficulties, however, could be met effectively by a Community transnational, scientific initiative complementing existing national scientific efforts, and targeted towards building stronger links and improved confidence between the processor, research groups and the consumer.

4. Review of Community Food Research Initiatives

The proposed programme builds upon several years prior experience of european collaboration in COST programmes, and will be complemented and supported by interactions with several other Community initiatives; these are outlined below.

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6 EUROSTAT

7 Based on data given by the Secretary to the ad hoc COST Food Technology Committee on 10.06.1987, from individual national representatives and personal communication from FAST food group.

COST-food Actions[8]: A Council Decision to initiate, a multiannual food science and technology programme, COST90 (The Effects of Processing on the Physical Properties of Foodstuffs) was taken in 1978. A year later a second action, COST91 (The Effects of Thermal Processing and Distribution on the Quality and Nutritive Value of Food) was approved. These programmes were undertaken as concerted actions in collaboration with the countries participating in the European initiative for cooperation in the field of scientific and technological research (COST).

COST90 and COST91 Actions were renewed for a further 4 years as concerted actions 90bis and 91bis, ending in 1987 and 1988 respectively. They have been extremely useful in fostering international collaboration, particularly in analytical methodologies, in the exchange of science and technology information and in clarifying areas needing further scientific input.

An ad hoc Committee with representation from COST participating States was set up in 1987 to prepare proposals for further COST actions in the field of food science and technology, some of these proposals are likely to be integrated and implemented as part of the FLAIR programme, on the advice of the Senior COST Officials and the recommendations of the CGC for Agro-Industrial Technologies.

Agriculture Research Programme: In the Community programmes to coordinate agricultural research[9] a number of food research topics were dealt with in the Agro-food programme. The work focussed on the quality of agricultural produce as influenced by production methods and techniques. Improving the quality of agricultural produce, particularly fresh products, for direct consumption is a main aim of an agricultural research programme being elaborated for the period of 1989-1993. The effects of new production methods, of harvesting and post-harvesting treatments, on the composition and quality of agricultural produce are included. Detailed discussions by the relevant services of the Commission have established that agricultural research on quality will be product orientated, and carefully selected, to ensure complementarity with the FLAIR programme and to avoid duplication.

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8 See Footnote N° 4.

9 COM (83) 641, "Council Decision adopting joint research programmes and programmes for coordinating agricultural research", 12.12.1983. OJ N° L 358/56, 22.12.1983.

Nutrition Research: The current medical and health research coordination programme[10] aims at promoting Community actions in areas critically relevant to the solution of major health problems including nutrition related projects on dietary factors and related diseases, and the development of epidemiological methodologies in nutrition research, which the present proposal complements.

Recently, the Commission has also implemented an R&D programme for the developing countries which includes nutritional aspects, relevant to sub- and tropical areas[11]. The proposed programme presented here, is directed towards the food system of the temperate regions and industrial food technology. Collaboration between the two programmes will take place, so that any relevant results will be communicated and applied.

Community Bureau of Reference (BCR) Programme: is aimed at improving methods of measurement and their accuracy in areas where measurements could give rise to problems/disputes at Community level. BCR has provided laboratories of Member States with a means of conducting collaborative measurement studies in the field of metrology (physical measurements) and chemical analysis. An extensive new programme now being discussed[12] includes veterinary and phytosanitary controls and processed foods (additives, nutritional labelling, dietetic foods, and bacterial contamination). Close collaboration between the BCR and the FLAIR team will ensure that the results of both programmes are appropriately used.

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10 COM (87) 551 "Council Decision adopting a research and development coordination programme of the European Economic Community in the field of medical and health research (1987-1991)", 17.11.1987. OJ N° L334 (p.20) 24.11.1987.

11 COM(86) 550 final/2, "Proposal for a Council Regulations (EEC) relating to a research and development programme in the field of science and technology for development 1987 - 1990. 17.11.1986.

12 COM (87) 444 final,"Council Decision adopting a research and development programme of the European Economic Community in the field of applied metrology and chemical analysis (1987-1992) (Community Bureau of Reference, BCR)", Council First Common Position taken in April 1988.

5. Consultations with Research, Food and Industrial Circles

The present proposed programme has been greatly assisted by the above mentioned Community actions and a range of consultations and investigations, summarised below.

Following the Versailles Summit of 1982 a working group on Technology, Growth and Employment suggested proposals deemed suitable for international cooperation in food technology. These included: raw materials; factors affecting food quality; process control and automation; food technology and developing countries; and the exchange/training of scientists.

In 1985 an EEC sponsored symposium was held in Copenhagen at which food scientists from several European countries discussed and made proposals for a collaborative European food research programme. Research topics included: the physical properties of foodstuffs; the effects of thermal processing and distribution; new food processing and storage technologies; quality assurance; food safety and wholesomeness. The present proposal has been guided by these priorities.

The FAST programme has studied medium to long term developments in the food industry and their implications for R&D, and has stressed[13] the need to emphasise quality, the importance of biotechnology related to the food industry, and better coordination between agriculture and the industry to ensure quality raw materials.

In 1986, the Commission issued a "call for expressions of interest", for the stimulation of agro-industrial developments[14]. Some 70 responses out of the total of 856, related to the provision of raw materials for the food industry, their utilization and transformation. While most of the ideas in the responses have been candidates for the ECLAIR programme, some not catered for relate to food quality, safety and nutrition. While carrying out further consultations, the Commission was advised of the importance of food science and technology, and the need for additional support. Independently, during the last two years a considerable number of informal expressions of interest and suggestions for an EEC Community initiative in food technology

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13 See Footnote N° 5.

14 The call was based upon the Commission discussion paper, "Biotechnology in the Community : Stimulating Agro-Industrial Development", COM (86) 221, 15 April 1986; a summary of the results is available in the working paper CUBE XII/233/87, "Stimulation of activities at the interface between agriculture and industry", March 1987.

was also received from national food research groups and food industry interests.

The Commission services also received advice and assistance in the preparation of this food programme from:

- the Management Committees of the concerted actions COST90 and 91;
- the "Confédération des Industries agro-alimentaires" (CIAA);
- the Standing Committee for Agricultural Research (SCAR);
- the Industrial Research and Development Advisory Committee (IRDAC) Working Party 5.
- the national authorities responsible for research in different Member and COST States participating in the food projects;
- individual senior food experts, active in Member States;
- the ad hoc COST Committee on Food Technology;
- the different Commission services concerned with food, notably the FAST-ALIM Programme group and the BCR programme.

6. Programme Structure and Content

The research activities proposed in this programme will all emphasise downstream aspects of food technology, and have been divided into the following three sectors:

- Assessment and Enhancement of Food Quality;
- Food Hygiene, Safety and Toxicological Aspects;
- Nutrition and Wholesomeness Aspects.

New technologies and processing innovations which enhance food quality, safety and nutritive values are also important and will be considered under each of the three sectors. Such processes would include new bio-physical separation/ fractionation techniques (e.g. the use of super-critical CO_2 fractionation) aimed at flavour enhancement and quality improvement; new uses of microorganisms and enzymes; new applications for aseptic processing technologies; development and application of variable temperature/time preservation techniques, and integrated process control systems which employ low cost rapid methods and utilise novel control and measurement techniques (e.g. bio-sensors). However, those technologies and innovations which involve combined food technology development with non-food processes or which do not directly address food quality, safety or nutritional aspects will normally form part of the ECLAIR programme[15].

6.1 Assessment and Enhancement of Food Quality

Today, food quality is a key factor for the consumer and in the developed world food markets. By quality, is meant those

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15 See Footnote N° 3.

attributes and perceived food characteristics that contribute to human satisfaction and well-being.

It is proposed to characterise objective assessments of quality, which are currently based on subjective criteria, by stimulating the further development of analytical methods and procedures to provide reliable, repeatable and more rapid quantitative measurements. The emphasis will centre on the new application of physical measurement techniques (e.g. nuclear magnetic resonance, infra red spectroscopy, gas-liquid chromatography) and biological procedures (e.g. immunological techniques and bio-sensors), in addition to physico-chemical, microbiological, enzyme and monoclonal methods. The objective is to enable a wider range of possible applications as part of overall quality control procedures and market demand. The results of the research carried out in this programme, could identify scientifically-based norms for defining food quality, particularly relating to industrial applications and contribute to the development of the internal market.

It is widely recognised there can be no unique objective analytical measurement of "quality" as the perceived characteristics of foods vary according to the environment, background and tastes of the consumer. Despite the inherent difficulties of obtaining a universal set of sensory tests, the fact remains that organoleptic and sensory quality are essential determinants of the acceptability of foodstuffs. There is an urgent need therefore, to intensify research directed towards the development of objective sensory test procedures and methodologies and to correlate them with other objective measurements.

With the consumer trends towards "fresh", "natural" and "organic" products, there is a need for further collaboration between different laboratories on the development of acceptable objective methods of assessing the "freshness" of processed foods. Readily applicable quality (freshness) assessment techniques would contribute greatly to increased efficiency in this sector and particularly in small units.

An important aspect for the food processing industry is the assessment of the composition of the raw materials as they affect the quality of the processed end product. It is proposed to support research on those quality characteristics of raw materials which facilitate or reduce processing costs and enhance consumer acceptability. These tests should be based on chemical, microbiological, monoclonal antibody, enzyme and other modern technologies. In order to build consumer confidence, the tests also need to be rapid, reliable and transparent; and could be used to provide and update point of sale information.

6.2 Food Hygiene, Safety and Toxicological Aspects

Because food and food products are perishable and also are potential carriers of harmful organisms, high safe and hygienic codes of practice are essential. The potential danger to consumers and damage to a whole sector of the food industry makes it essential for society and industry that customer confidence is maintained through the development of a transparent code of practice throughout the food chain.

The problems of identifying and locating sources of contamination (microbial or other) in food systems present considerable difficulty and require transnational scientific cooperation to control and understand. Furthermore, new product development has been slowed down by the cost and time factors associated with conventional toxicity testing. Therefore, there is considerable scope for the development of new safety evaluation techniques in the field of food microbiology and toxicology, which would be useful for novel food processes and chemical and microbiological changes associated with these processes. Such initiatives would include:

- improved rapid screening tests to predict potential toxicity factors;
- research on the occurrence of natural plant toxins and their effects on food;
- research and development in predicting microorganism growth rates, accelerated methods for specific organisms and total counts;
- research to improve the understanding of the relationship between food constituents and food allergies (immunogenic properties); and
- the application of these tests in food processing and new food product development to ensure the safety of both processes and products.

6.3 Nutrition and Wholesomeness Aspects

The increased consumer emphasis on the health aspects of food has resulted in a range of new and altered food products becoming available, e.g. high fibre diets and low calory bulk ingredients.

Research that resolves processing difficulties in reducing levels of some ingredients (such as fat, sugars, salt) in formulated foods will be supported. In particular, applications of new enzymes or systems which permit the substitution of ingredients by others having similar or better functional properties but of greater nutritional values will receive priority.

In addition, research on up-to-date nutritional methodologies should continue to be applied to the evaluation of key foods and foods resulting from novel processes. This includes the nutritional bioavailability of food constituents (such as

vitamins and minerals) and how it is affected by processing, distribution systems, storage, catering and home preparation.

The effects of processing procedures on nutrient changes in foods assigned to or favoured by sub-groups of the population such as infants and the elderly or those who frequently consume a limited range of particular foods, should continue to be investigated. Similarly, attention should focus on foods designed for particular nutritional uses, e.g. low energy foods for slimming; high energy foods for athletics. Where relevant, information from the nutrition research activities within the Medical and Health Research programme[16] should be taken into account.

7. Management of the Programme

7.1 Preparation and Management

On the basis of the programme outlined in the Council Decision, the Commission shall further define and prepare the actual activities, and later, manage the programme. In these tasks, the Commission will be assisted by an Agro-Industrial Technologies CGC (Management and Coordination Advisory Committee).

FLAIR and ECLAIR will both pursue the objectives of action line 4.2 of the Framework Programme "agro-industrial technologies". The two programmes have been devised to complement each other while having individual characteristics. Thus, in order to ensure maximum cohesion and efficiency, the Commission proposes that the same CGC, meeting in special "configurations" as appropriate, deal with both programmes.

7.2 Concerted and Cost-shared Actions

Projects will be undertaken in the form of either concerted actions or cost-shared R&D contracts.

The allocation between concerted and cost-shared actions should be made on the basis of the urgency in achieving results; whether there already exists a significant research input in the subject by national groups and which only require strengthening through international collaboration (concerted actions); or whether a significant new research initiative is warranted (cost-shared).

Some possible concerted action projects are suggested here: the development of methods for measuring food "freshness"; defining raw materials quality; natural plant toxins; rapid tests for commercial plants (applications); food ingredient substitution; effects of cooking on nutritive values.

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16 See footnote 10

7.3 Evaluation

The programme will be evaluated in accordance with the "Community plan of action relating to the evaluation of Community research and development activities for the years 1987 to 1991" (COM (86) 660 final). A sum of approximately 120.000 ECUs is foreseen for this purpose.

7.4 Participation and Programme Coordination

Effective coordination particularly with national groups is essential to the success of this programme. Participation in a Community context could offer these groups access to a wider range of expertise, technologies and industrial partners to share costs and risks; would provide small research groups with access to Community technical information otherwise difficult to acquire; and would enable them to participate with larger groups and share in achieving successful results.

This collaboration can be achieved with the assistance and co-operation of national representatives on interested CGCs, SCAR, and COST/food programmes, through individual members of IRDAC[17], and through close cooperation between the relevant services of the Commission.

Those projects conducted as concerted actions are open to all member States; to non-member European countries which have concluded framework agreements for S/T cooperation with the Community, or COST participating States. Those concerted action projects with industrial participation will receive priority.

Participants in cost-shared research projects can be industrial and food firms, cooperative groupings of such firms, research institutions and universities, established in the Community or in non-member European countries which have concluded framework agreements for S/T cooperation with the Community. It is recommended that each project, in the form of a cost-shared action, should include an industrial partner.

An "Information Package" will be issued containing additional relevant information and necessary forms; advance notice will be published in the Official Journal.

7.5 Training/Mobility Grants

Provision for training/mobility grants will be included in the programme specifically linked to the objectives of the projects undertaken, and along the same basis as provided for in ECLAIR, i.e. such grants will normally be used to support individuals participating in the project activities, with flexibility as

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17 See Section 5 for full titles

necessary to ensure maximum benefits and best use of the resources involved.

7.6 Exploitation of Results and Dissemination of Information

The general rules for the dissemination and utilization of results from research in science and technology described in COM (88) 260[18] will be applied in FLAIR.

Details on rights of access, licenses and other general information will be published, as for "ECLAIR", in an "Information Package" which will be available before the official "Call for proposals".

8. Criteria for Project Selection

The scope of activities in a development programme of this kind is potentially wide. In order to avoid the dispersion of budgetary funds over a wide range of research initiatives unlikely to reach critical size, it is essential to focus on certain types of activities, selected by the stringent application of appropriate criteria. The following criteria will be applied :

(i) Projects should be primarily oriented towards the practical application of the results of more basic or laboratory research and should be based on firm scientific grounds;

(ii) In selection, emphasis will centre on prospects for ultimate economic feasibility and contribute to the strength and competitiveness of the European food industry;

(iii) Proposals for cost-shared support will normally be expected to include financial commitments amounting to at least 50% of the project costs during the contract period. Priority will be given to those proposals in which the 50% comes predominantly from industrial sources. Similarly within those areas chosen for concerted action, priority will be given to those proposals which include industrial participation;

(iv) Projects must avoid undesirable effects on the environment; specific beneficial effects would be a factor meriting favourable consideration;

(v) Proposals should be designed to facilitate ease of evaluation and international comparability;

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18 COM(88) 260, "Communication from the Commission accompanied by a draft Council decision adopting a specific programme for the dissemination and utilization of results from research in science and technology". 10 May 1988.

(vi) Project selected must not lead to distortions of competition in Community markets; however, projects which include the participation of small and medium enterprises will be favourably considered;

(vii) Proposals should be clearly aimed at contributing to the programme objectives set out and should directly relate to the food quality, safety (toxicology), nutrition and/or to new technologies considered to enhance these aspects.

9. Relationships and Cooperation with other Community Programmes

The overall approach of the proposed programme will be strengthened by close coordination and collaboration with the Community programmes related to food, notably those described in Section 4, above. This cooperation will ensure mutual benefits and the avoidance of duplication, and should promote the best use of the research results.

10. Financial and Contractual Aspects

It is envisaged that the Community contribution to the costs associated with concerted action projects, and involving a number of States, would be 200,000 ECU/year on average. Some 7 such actions could be supported, which would indicate a total cost of 5.6 MioECU to the Commission.

For cost-shared projects an average of 100,000 ECU total costs per participant per year are envisaged (of which the Community would contribute up to 50%). The remaining 50% is expected to be supplied by the participants, predominantly from industrial sources. On the basis of an average of 5 collaborating groups or agencies forming a project, this would indicate a total cost per cost-shared project of the order of 2 MioECU over a 4 year period. It is envisaged that about 16 such projects could be conducted, with the Community contribution not exceeding 50% of the total.

The proposed programme includes a wide range of topics and anticipates a large number of participants. Due to the scale and range of projects carried out as either concerted or cost-shared actions, with the possible participation of non-Member European States, a minimum of 5 staff are deemed essential for the effective implementation of this programme: 2 grade A, 1 grade B, and 2 grade C.

PROPOSAL FOR A COUNCIL DECISION

adopting a research and technological development programme

in the field of food science and technology (1989 to mid-1993)

"F L A I R" :

Food-Linked Agro-Industrial Research

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular to Article 130 Q (2) thereof

Having regard to the proposal from the Commission[1],

In cooperation with the European Parliament[2],

Having regard to the opinion of the Economic and Social Committee[3],

whereas Article 130 K of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

whereas by its Decision of 28 September 1987[4], the Council adopted a framework programme of Community research and technological development (1987-1991), providing for activities to be implemented to ensure the exploitation and optimum use of biological resources;

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1 OJ N° C.

2 OJ N° C.

3 OJ N° C.

4 OJ N° L302, 24.10.1987, p. 1

whereas the framework programme sets out criteria to evaluate each specific programme and to select Community actions, which include that of contributing to the strengthening of the economic and social cohesion of the Community, consistent with the pursuit of scientific and technical quality;

whereas a multiannual programme of research and development programme in the field of food science and technology (FLAIR) will assist in the combined progress in public health and consumer protection with industrial and economic development within the Conmmunity;

whereas having regard to the fact that the specialised skills and capabilities relevant to food technology are numerous, and Europe's most internationally competitive capabilities are located in diverse Member States, mutual benefit shall be derived from collaboration in a Community programme;

whereas pursuant to the Council Decision of .. .. 1988[5] adopting a first multiannual programme for biotechnology-based agro-industrial research and technological development (ECLAIR), a Management and Coordination Advisory Committee (CGC) was created and whereas it is desirable that the same CGC assist the Commission in the implementation of this programme;

whereas four Community-COST concertation Agreements on four concerted action projects in the field of food science and technology[6] have produced encouraging results, and further initiatives in the COST framework in this field, are underway;

whereas the participation of European non-Member States wholly or partially with projects in this programme is desirable;

whereas it is desirable to involve small- and medium-sized enterprises to the maximum extent possible in the food science and technology research and development programme;

whereas the Scientific and Technical Research Committee (CREST), was consulted on the following measures and has expressed its opinion on the Commission's proposal;

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5 O.J. N°

6 OJ N° L54 (p.25), 25.02.1978; OJ N° L270 (p.53), 27.10.1979; OJ N° L39 (p.30), 15.02.1980; L350 (p.54), 23.12.1980; OJ N° L353 (p.25), 15.12.1982; and OJ N° L151 (p.46), 07.06.1984.

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme for the European Economic Community in the field of food technology, as defined in the Technical Annex, is hereby adopted for a period of four and a half years, from 1 January 1989.

Article 2

The funds estimated as necessary for the execution of the programme amount to 25 million ECUs, including expenditure on a staff of 5.

Article 3

The programme shall consist of work carried out as concerted and cost-shared actions, and by training/mobility grants.

Detailed rules for implementing the programme are set out in the Technical Annex.

Article 4

In the third year of the programme implementation, the Commission shall undertake a review and report to the Council and the European Parliament on the results thereof, together, if necessary, with any proposals for modification or prolongation in the light of the interim results achieved.

An evaluation of the results achieved shall be conducted by independent experts and published in the form of a communication to the Council and the European Parliament.

The above mentioned reports shall be established having regard to the objectives set out in Annex to this Decision, in particular for the improvement of food safety and quality for the consumer, and in conformity with the provisions of Art. 2 (2) of the framework programme.

Article 5

The Commission shall be responsible for the execution of the programme and be assisted in its implementation by the Management and Coordination Advisory Committee (CGC), set up by the Council Decision N° ../... EEC of .. .. 1988.

The contracts entered into by the Commission shall regulate the rights and obligations of each party, in particular the methods of disseminating, protecting and exploiting the research results.

Article 6

The Commission is authorised to negotiate, in accordance with Art. 130 N of the EEC Treaty, agreements with international organizations, with those non-member States participating in European cooperation in the field of Scientific and Technological Research (COST) and with those European countries having concluded framework agreements in S/T cooperation with the Community, with a view to associating them wholly or partially in concerted actions within this programme.

Where Framework Agreements for scientific and technical co-operation between non-Community European countries and the European Community have been concluded, organizations and enterprises established in these countries may, under appropriate conditions to be defined by the Commission, become partners to a cost-shared project within this programme.

Article 7

This Decision is addressed to the Member States.

Done in Brussels,

For the Council,

The President

TECHNICAL ANNEX

for a specific research and technological development programme in the field of food science and technology (1989 to mid-1993)

Objectives

The objectives of the programme are to contribute in the medium and longer terms to Europe's competitiveness in the food industry, the improvement of food safety and quality for the consumer; the strengthening of the food science and technology infrastructures in Europe, in the context of the harmonious development of the internal market. The programme is targeted at complementing existing initiatives in Member States through the development of further collaborative linkages between different research groups and industries, and shall concentrate on the interface between food processing, food distribution and the consumer. The consumer demands for more natural and healthy foods, with greater diversity, shall be met by the combined efforts of researchers and the food industry. Conservation, enhancement of nature and environmental protection shall be systematically taken into consideration in the execution of the programme.

CONTENT

The research activities in this programme have been divided into three sectors. New technologies and processing innovations, which enhance food quality, safety and nutritive values, shall also be supported in each sector.

1 ASSESSMENT AND ENHANCEMENT OF FOOD QUALITY shall consist of research and development on:

- quantitative measures of "quality";
- objective organoleptic and sensory criteria and their to relationship to quality;.
- quantitative measures of "freshness" of processed foods;
- the quality aspects of raw materials as they affect processing and end products; and
- new technologies and processing innovations which enhance food quality while also facilitating processing, and building consumer confidence.

2 FOOD HYGIENE, SAFETY AND TOXICOLOGICAL ASPECTS shall concern research and development on :

- improved rapid screening tests to predict potential toxicity factors;
- the occurrence of natural plant toxins and their effects on food;
- predicting microorganism growth rates, accelerated methods for specific organisms and total counts;
- improved understanding of the relationship between food constituents and food allergies; and
- the application of these tests in food processing and new food product development to ensure the safety of both processes and products.

3 NUTRITION AND WHOLESOMENESS ASPECTS shall consist of research and development on :

- new processing techniques, applications and natural ingredients which provide high nutritional and wholesomeness values;
- methodologies for the nutritional evaluation of foods;
- the bioavailability of the nutritional constituents (e.g. vitamins and minerals) and the effects of processing, distribution, catering, storage and home treatment;
- the nutritional and wholesomeness value of foods designed for particular uses (e.g. slimming or athletics) or important to sub-groups in the population (e.g. infants and the elderly); and
- those new processes and technologies which enhance the nutritional and wholesomeness of foods.

IMPLEMENTATION

The programme shall consist of work carried out as concerted and cost-shared actions, and by training/mobility grants. All projects shall be carried out by participants from more than one Member State.

Participation in a concerted actions is open to all member States, to non-member European States which have concluded framework agreements in S/T co-operation with the Community and COST participating States.

Participants in a project conducted as a cost-shared action, may be industrial enterprises, research institutions, universities or combinations of them, established in the Community or in those non-member European States which have concluded framework agreements in S/T cooperation with the Community.

As a general rule, research institutes and universities shall participate in a group together with one or more industrial organizations. Research institutes which are funded principally or exclusively by industrial organizations shall be considered as industrial participants.

For those actions which are conducted on a cost-shared basis, the Community contribution shall not normally exceed 50% of the total expenditure, the remainder to be provided mainly from industrial sources.

Training/mobility grants shall be included to facilitate the assembly of relevant skills at appropriate locations for the work of the projects, and to promote effective diffusion of the knowledge resulting from them. The programme shall also include coordination activities such as the organization of meetings, consultation with national experts, and diffusion of information on the progress and results of the projects.

EVALUATION CRITERIA

The Commission's Communication to the Council concerning a Community Plan of Action relating to the evaluation of Community research and development activities for the years 1987 to 1991 (COM (86) 660 final) states that the objectives and milestones of each research programme have to be set out in a testable form, which are set out below.

1. The long term objective of this programme is to contribute to the competitiveness of Europe's food industries, and to improved consumer protection and confidence, by strengthening the links between them through research and development. The Commission proposes to achieve this objective by launching a programme of concerted actions and cost-shared actions. The projects seek to promote the close collaboration between research and industrial groups, by their participation in research and technological development on food quality, hygiene, safety, toxicology, nutritional and wholesomeness values.

2. The primary short term objective is that the programme should succeed in eliciting proposals, for concerted actions (with national agreement) and for R&TD cost-shared projects (with commitments to co-finance from industry), on a scale commensurate with the Community resources proposed. This objective shall be testable in 1991-1992.

   At this time, the programme should also demonstrate its promotion and encouragement of inter-sectoral collaboration, across the Member States and in Europe.

3. Particular objectives to be attained within three years of the programme implementation are as follows:

3.1 that improved food evaluation and assessment techniques have been developed, in particular sensory analysis, and that the results have given grounds to expect that they will find applications which will benefit industry and/or the consumer;

3.2 that new, rapid tests for food hygiene, safety and toxicological aspects have been developed; that advantages in terms of precision, effectiveness, or the avoidance of possible adverse side-effects have been indicated; and that as a result of the tests the products, techniques or services have practical applications for industry and/or the consumer;

3.3 that research and development has been conducted on the nutritional value of foods; that useful tests have been developed to measure the nutritional value of food constituents, including the effects of processing; and that as a result the nutritional and wholesomeness values of those foods are enhanced; and

3.4 that studies and tests have been conducted for the development of new, novel processing technologies or innovations which enhance food quality, safety, and nutritional value and that as a result of such studies and projects new applications have been found.

4. In addition, the programme should ensure that the following general criteria are met:

4.1 that the potential increase in market opportunities, in medium or long-term, as a result of the improvements or benefits demonstrated, is of a size to justify the Community expenditures committed;

4.2 that the consumer confidence in food research and industry is encouraged and high standards for consumer protection are maintained;

4.3 that throughout the execution of the programme the projects should have taken adequately into consideration the conservation, enhancement of nature and environmental issues;

4.4 taking account of the results of Community, national or private sector research activities in food science and technology, the evaluation panel shall consider whether the FLAIR programme has contributed to the application of the results of the said research activities in regions of the Community other than those in which the research was conducted, and has produced added value attributable to the Community character of the programme (i.e. not readily obtainable via Member State actions alone).

FINANCIAL STATEMENT

1. Budget Heading : 7343 (1989)

FLAIR (Food-Linked Agro-Industrial Research) is a multi-annual programme for supporting research and technological developments in food science and technology.

2. Legal Base : Article 130, Council Decision

3. Description of action and objective :

The global objective of the programme here proposed is to contribute in the medium and longer terms to enhancing Europe's competitiveness in the food industry; improving food safety and quality for the consumer; strengthening the food science and technology infrastructures in Europe; and the harmonious development towards the internal market. The programme is targeted at complementing existing initiatives in Member States through the development of further collaboration between different research groups and industries, and meeting the consumer demands for more natural and healthy foods, with greater diversity.

The FLAIR programme provides for two types of actions: concerted or coordination activities; and pre-competitive cost-shared R&TD projects; both of which are aimed at the interface of industry and the consumer.

This multi-annual programme has 3 sectors. Within each sector, concerted and cost-shared actions shall be carried out where each is most appropriate. Furthermore, in each sector, grants may be awarded for training and mobility, to facilitate the assembly of relevant skills and the diffusion of results.

Sector 1 :

the Assessment and Enhancement of Food Quality

by means of

research and development on:

- quantitative measures of "quality";
- objective organoleptic and sensory criteria and their to relationship to quality;
- quantitative measures of "freshness" of processed foods;
- the quality aspects of raw materials as they affect processing and end products; and
- new technologies and processing innovations which enhance food quality while also facilitating processing, and building consumer confidence.

Sector 2 :

Food Hygiene, Safety and Toxicology Aspects

by means of

research and development in:

- improved rapid screening tests to predict potential toxicity factors;
- research on the occurrence of natural plant toxins and their effects on food;
- research and development in predicting microorganism growth, accelerated methods for specific organisms and total counts;
- research to improve the understanding of the relationship between food constituents and food allergies (immunogenic properties); and
- the application of these tests in food processing and new food product development to ensure the safety of both processes and product.

Sector 3 :

Nutrition and Wholesomeness Aspects

by means of

research and development work on:

- new processing techniques, applications and natural ingredients which provide high nutritional and wholesomeness values;
- methodologies for the nutritional evaluation of foods;
- the bioavailability of the nutritional constituents (e.g. vitamins and minerals) and the effects of processing, distribution, catering, storage and home treatment;
- the nutritional and wholesomeness value of foods designed for particular uses (e.g. slimming or athletics) or important to sub-groups in the population (e.g. infants and the elderly); and
- those new processes and technologies which enhance the nutritional and wholesomeness of foods.

4. Justification of the action

Food science and technology forms an integral part of the food system, which ranges from producers, processors and distributors to the consumer. This large sector of the economy represents many small firms which rely on national government research for the scientific and technological support necessary to compete in the market place. The food system is constantly evolving, becoming more transnational and competitive, and requiring increasing levels of technical sophistication and multi-disciplinary skills.

In addition, there is new consumer interest and demand for healthy, nutritious foods and for greater variety. These needs and levels of complexity are beyond the capabilities of many national programmes, and require a Community initiative to enhance their coherence and effectiveness.

Consultations, with various national groups and industrial representatives has revealed strong support for a Community-led initiative in this field, which would complement national research efforts and assure mutual benefits.

In the medium and long terms, it will lead to increased economic growth, and to the development of a wider range of market opportunities for quality food products; increasing the competitiveness of the food industry in European; for the harmonious development of the internal market; and increased consumer confidence and protection.

5. Financial incidence of action on expenditures[1] (Million ECUs)
(including costs for staff and expenses for administrative and technical management)

5.1 Total cost over the whole of the expected duration :

From the Budget of the Communities	:	25.000
From other sectors at the national level	:	45.000
TOTAL		70.000

1 The Council Decision concerning the Framework Programme of Community Activities in the field of Research and Technological Development (1987 - 1991) COM (86) 430 final includes the provisions for this action under Action Line 4.

5.2 Schedule of Commitment Appropriations and Payments - FLAIR

Commitment Appropriations	1989	1990	1991	1992	1993	Total
Contracts	4.846	4.700	5.060	4.590	1.940	21.136
Operating Costs	0.220	0.480	0.570	0.520	0.560	2.350
Personnel costs	0.234	0.320	0.370	0.390	0.200	1.514
TOTAL	5.300	5.500	6.000	5.500	2.700	25.000

Payment Appropriations	1989	1990	1991	1992	1993	1994	1995	Total
Contracts	1.146	3.179	4.356	4.831	4.056	2.429	1.139	21.136
Operating Costs	0.220	0.480	0.570	0.520	0.560			2.350
Personnel costs	0.234	0.320	0.370	0.390	0.200			1.514
TOTAL	1.600	3.979	5.296	5.741	4.816	2.429	1.139	25.000

5.3 Method of calculation

a) Expenditure by contract

This expenditure covers the Community's financial contribution to: those activities carried out as concerted actions to be carried out by participating European States; pre-competitive research and development work, under cost-shared contracts to be concluded with research and industrial (food) groups established and active in Europe, including small and medium sized enterprises (average Community financial contribution - about 50% of total costs); to studies, analytical work, and training/mobility grants for each type of action.

b) Operational expenditure

Administrative costs (management committee and working party meetings, document distribution or dissemination of techniques, use of data processing and telecommunications facilities). And supporting coordination activities.

c) Personnel costs

The requirements of this programme have been estimated on the basis of a management staff of :

2 temporary officials - category A
1 temporary official - category B
2 temporary officials - category C,

together with costs of missions and consultants. This staff is requested under the Budgets 89 to 93.[2]. For 1989, the expenditure concerning personnel has been calculated on the following basis (see P.D.B 89): A = 93.000 ECU; B = 58.000 ECU; C = 37.000 ECU. For 1993, the expenditure concerning personnel has been calculated at 50%, as the programme is scheduled to conclude in mid-1993.

6. Financing of expenditure

The appropriations required to cover the Community's contribution to this project are to be entered in the Community's future budgets.

7. Type of Control

- Administrative control by the Director General for Financial Control as regards budget implementation

- Scientific Control :

  . CGC Committee;
  . Officials of the Commission
  . Audit by the Court of Auditors in accordance with provisions of the Treaty.

- The programme will be evaluated in accordance with the "Community plan of action relating to the evaluation of Community research and development activities for the years 1987 to 1991" (COM (86) 660 final). See Evaluation Criteria in annex.

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2 Staff is 1 A, 1 B and 1 C in 1989; 2 A, 1 B and 1 C in 1990; and 2 A, 1 B and 2 C in 1991-93. The cost of new staff has been calculated at 50% in the commencement year, and in the following years, 4% inflation has been provided for.

COMPETITIVENESS AND EMPLOYMENT IMPACT STATEMENT

I. Reason for proposing the programme

The main reason for the proposed technical development programme is to promote industrial competitiveness and economic growth in the medium and long terms through encouraging research and development which enhances the quality, safety and nutritional profile of the outputs of the European food industry.

The structure of the European food industry (predominantly small scale), makes public research a necessity. The relatively small scale of national research groups faced with the growing transnational nature of the food system and the rapid changes in food demand patterns towards "healthiness" and diversity, makes collaborative research and development imperative.

II. Features of the businesses involved

Despite advances elsewhere, food remains the Community's largest industry. The sectors involved in the food system account for around 20% of the Community's work forces and contribute 10% of its income (see FAST II final report). Principally involved in the current proposal are:

- 4 million employees of the food processing sector;
- 10 million upstream agricultural suppliers, whose own competitiveness depends on their ability to supply the correct quality raw material to a health food processing sector;
- 10 million down-stream employees of the food distribution and catering sector, the direct interface with the consumer and responsible for quality maintenance during the between time of manufacturing and consumption;
- suppliers of non-agricultural inputs to food processing (e.g. flavours, colours, preservatives, enzymes and food processing machinery).

The proposal should stimulate in the medium term the competitiveness of European industry, both those which participate directly, and those which are informed of the results; but the projects themselves shall be at the pre-competitive development level.

The effects of the programme are not expected to favour specific geographical areas. In the call for expressions of interest for ECLAIR, responses relating to food were received from every Member State. COST-food actions similarly involve all Member States.

III Obligations which this programme imposes directly on businesses

The conditions for participation in the cost-shared actions (i.e. transnational co-operation, normally 50%, mainly industrial, financing expected, at least one industrial or agricultural partner per project) will ensure the business orientation of the programme. There is of course no obligation to participate. Particular emphasis shall be placed on communication and diffusion activities during and after the programme. (It is envisaged that this shall be the full-time responsibility of one of the A-category personnel).

IV Indirect obligations which national, regional or local authorities might impose on businesses

By implementing this draft Council Decision no action is required by national governments or local authorities. This proposal does not have any disadvantage to firms, except for the costs relating to the preparation of unsuccessful proposals. There is also the positive benefit of the "free consultation" and authoritative feedback provided, even on rejected proposals.

V Provisions in respect of SMEs

While no formal provisions in respect of SMEs have been proposed in this programme, they would be foreseen as major beneficiaries of this proposal. Being unable to undertake research on their own, such firms are dependent on the results of publicly funded research and development. However, their participation in a project shall be favorably considered in the selection of projects.

Dissemination of information about the research results shall be given particular priority. Special emphasis shall be placed on the availability of this information to SMEs.

The conditions of participation, modelled on those of the BRITE programme, offer to SMEs the advantage that all signatories to an FLAIR contract shall be treated on an equal basis.

VI Likely effect on :

a) the competitiveness of business

As FLAIR is aimed at pre-competitive development, directly at promoting European industrial competitiveness through the enhancement of the quality, safety, and nutritional profile of food; promotion of collaborative research; and the development of better links between processors distributors, researchers and consumer, there should be some medium and certainly long term effects in enhancing the competitiveness of European industry - see point I.

b) on employment

The effects on employment are difficult to estimate, against the background of long-term decline in employment in all food system sectors. However, greater international competitiveness of the European food processing sector may, in the long term, bring about favourable consequences for employment in the industry, particularly in small firms with growth opportunities in specialist high-value market niches. Agricultural employment will similarly benefit from a competitive processing sector in rural areas. Catering and distribution sectors employment will not be adversely affected.

VII Consultation of relevant representative organizations

The programme has been presented to the CGC (Management and Advisory Committee) for the Biotechnology research programme, the Standing Committee on Agricultural Research, and the Working Party on Biotechnology of the Industrial Research and Development Advisory Committee (IRDAC). This comprises members from all sectors of industry, industrial research institutes and trade unions.