



BaSeFood

Sustainable exploitation of bioactive components from the Black Sea Area traditional foods (FP7-KBBE-227118)

General aspects, and current status

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BaSeFood Consortium



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2. Institute of Food Research (IFR), United Kingdom
3. Hellenic Health Foundation (HHF), Greece
4. Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA), Portugal
5. Odessa National Academy of Food Technologies (ONAFT), Ukraine
6. Uzhhorod National University (UZHNU), Ukraine
7. Moscow State University of Food Productions (MSUFP), Russian Federation
8. Spread European Safety - European Economic Interest Grouping (SPES – GEIE), Italy
9. Bucharest University of Economics (ASE), Romania
10. Biological Farming Association – Elkana (ELKANA), Georgia
11. Institute for Medical Research (IMR), Serbia
12. University of Food Technologies (UFT), Bulgaria
13. T C Yeditepe University (YEDITEPE), Turkey



BaSeFood data

- Nature: Small cooperation program
- Duration: 36 months
- Launched: April 1, 2009



The call

KBBE-2008-2-2-02: Bioactive compounds in traditional food products - SICA (Black Sea Region) Call: FP7-KBBE-2008-2B

The aim of the topic is to **identify and characterise bioactive compounds in traditional food products** that can be **beneficial for human health** and are typical for the diet of EU neighbouring regions. *Scientific data on the risks and benefits linked to these products or compounds will be produced and evaluated. It will include the study of the role and the mechanisms (absorption and activity) of bioactive compounds and also the factors influencing their functional properties (e.g. processing).*

Expected impact: To increase knowledge of nutrients, food components and/or bioactive compounds effects on human health, to provide sound scientific data and to help in **substantiating health and nutritional claims. Enhance the cooperation** between scientific disciplines and stakeholders (**nutrition, practitioners, local food companies, etc.**). This should help the EU food industry to increase its innovation potential and competitiveness, in particular regarding **traditional foods** and SMEs.



**The concepts of
traditional foods
and
healthy foods**

originally do not belong to the same sphere of perception



Concepts from related areas

Area 2.2.2 Nutrition

*Understanding beneficial and harmful dietary factors **as well as the specific needs and habits of population groups**..... It could lead to **reformulation of processed foods**, and foods with nutritional and health claims. **The investigation of traditional, local, and seasonal foods and diets will also be important**.....*

Area 2.2.1 Consumers

*Understanding consumer behaviour and consumer preferences as a **major factor in the competitiveness of the food industry** and the impact of food on the health, and well-being of the European citizen. The focus will be on **consumer perception and attitudes towards food including traditional food**, understanding societal and **cultural trends**.....*

Area 2.2.3 Food processing

Theme 6. Environment

Area 3. Biodiversity and sustainable exploitation for the production of biological resources



Concepts

- plant bioactive components
- healthy foods / health claims
- traditional foods
- sustainability
- Black sea region
- Europe

General objectives

To contribute at establishing a rationale to integrate the concepts of health- promoting foods and traditional foods, in order to create the **knowledge base** for a sustainable economic development of traditional foods, tradition-based healthy foods and related areas.

BaSeFood challenges

A. Create opportunities. These will be attained through RTD activities, generating a base of knowledge from which SMEs and other stakeholders can derive transferable information for product development in a European regulatory context. Involvement of SPES-GEIE (coordinator of the **TRUEFOOD** a FP6 IP, dr. Daniele Rossi), as BaSeFood partner



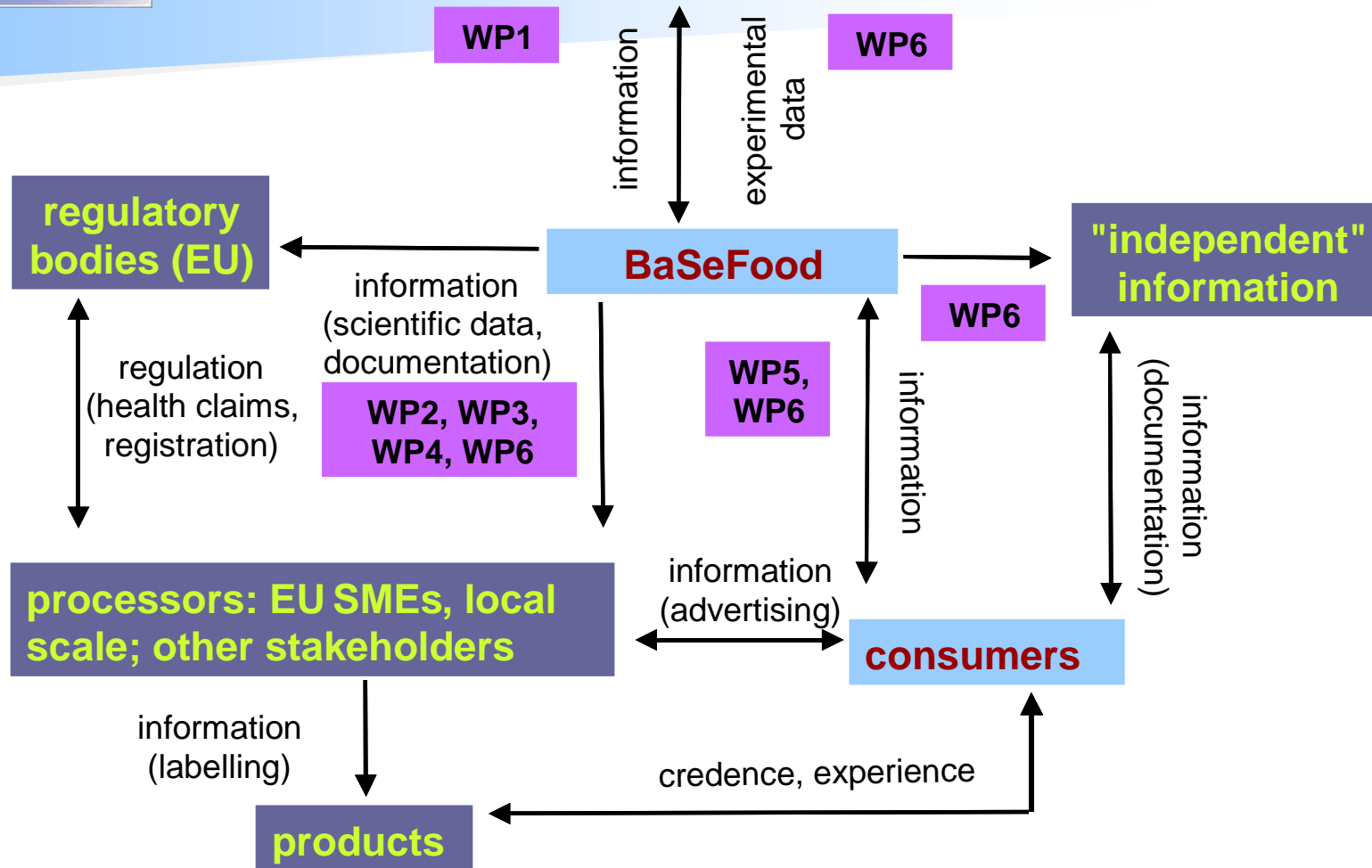
BaSeFood challenges

B. Create trust. Especially towards consumers, in order to enforce the synergy between the health promoting and the traditional food characteristics, in a **broad sense sustainability context**:

- the need of **producing high quality** data for health claim substantiation, in order to promote long term sustainable economic development
- the importance of **consolidating consumers self awareness**, as a basis of long term trust on the traditional food message
- the added value of considering topics related to the **preservation of local cultures and crops**, and enhance ethic trade as integral parts of food credence quality traits
- The final aim is to put bioactive substances and related health claims in a favourable, consumers friendly context, independently of strictly regulatory facts.
- The recent results of the health claims submitted to EFSA seem to fully support this integrated approach.

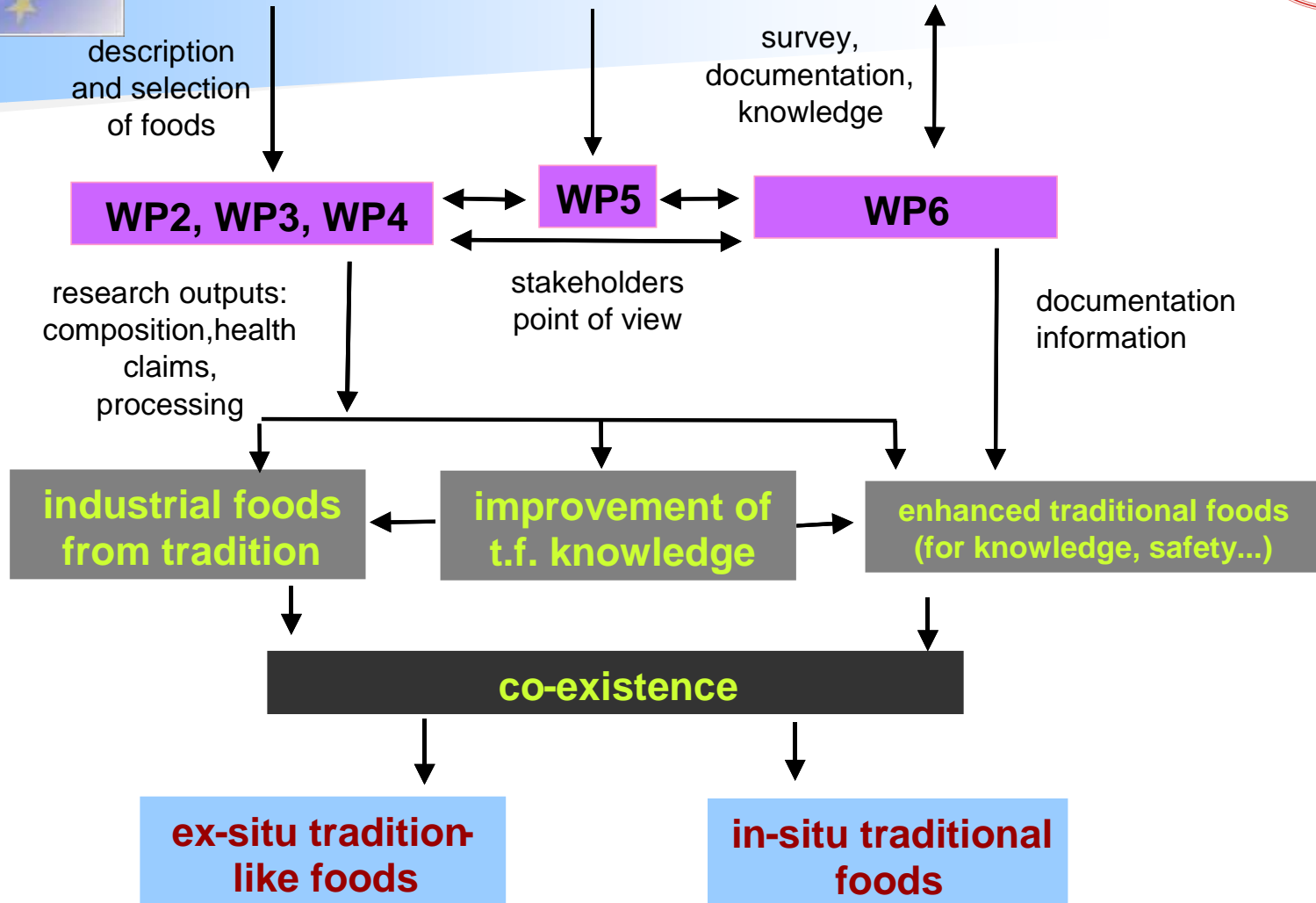


traditional foods of plant origin, bioactives





WP1 Traditional food surveying, documenting, sampling





**In the BaSeFood methodological background
there are several points coming from EuroFIR**

Integration in

- **Using this background**
- **Hopefully contributing with further input**



WP1. Surveying, recording and describing traditional foods leader: HHF, Athens - prof. Antonia Trichopoulou

STARTED

Selection of 30 foods

- **recording**
- **description**
- **analysis**
- **bioactivity**

Foods in their context

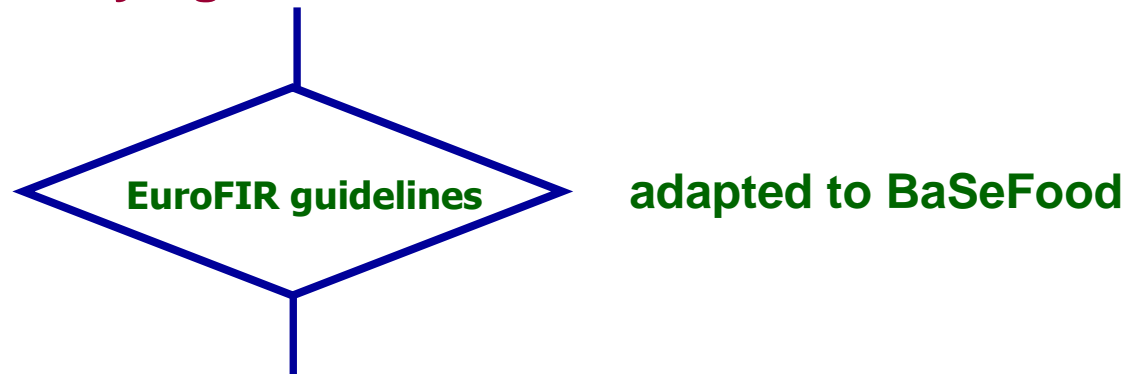
- **environmental, ethnobotanical and cultural;**
- **raw materials and ingredients (composition);**
- **processing, home preparation;**
- **present consistency and importance.**

diversity
follow ups



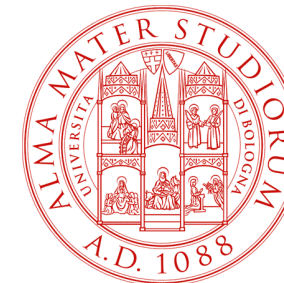
WP1. Surveying, recording and describing traditional foods leader: HHF, Athens - prof. Antonia Trichopoulou

1.1. Surveying traditional foods of the BSAC



National documented files

- **Description / origination of the food**
- **Traditionality according to the EuroFIR definition**
- **Consumption of the food or its wider food category**
- **Composition of the food or its wider food category**
- **Potential bioactive components**
- **References**



1.1. Some Turkish examples

Food Code	Food Name (English)	Food Name (National)	Region of Origination	Food Description	Ingredients (English)
1	corn bread	<i>misir ekmeği</i>	Black Sea Costal Area/Tur	bread, round shaped, 2-3 cm	corn meal butter water salt
2	cracked corn soup	<i>misir yarması corbası</i>	Black Sea Costal Area/Tur	thick corn soup	cracked corn dried pinto beans yoghurt salt water
3	corn meal mash	<i>kuymak</i>	Black Sea Costal Area/Tur	porridge	corn meal butter water kolof cheese
4	kale soup	<i>kara lahana corbası</i>	Black Sea Costal Area/Tur	soup	kale corn meal dried pinto beans butter salt water
5	stuffed kale leaves	<i>kara lahana sarması</i>	Black Sea Costal Area/Tur	fingerlike stuffed kale leaves	kale cracked corn minced red meat butter onion salt black pepper
6	kaygana	<i>kaygana</i>	Black Sea Costal Area/Tur	thick pide with vegetables	kale corn meal eggs vegetable oil salt



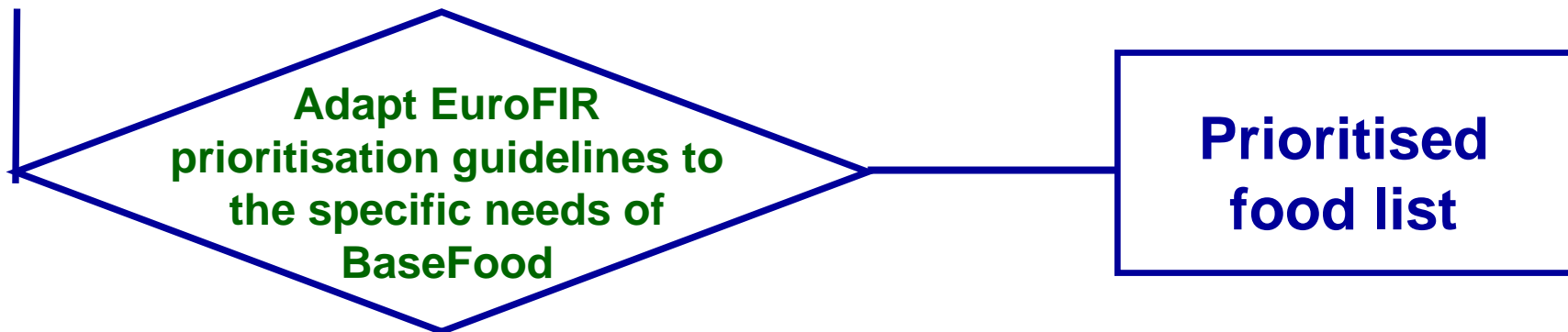
1.2. Selection of traditional foods of the BSAC

Preliminary (external to foods)

- Collection of availability data from HBS
- Collection of supply data from FBS
- Collection of WHO mortality data of the BSAC

Selection criteria (intrinsic to foods)

- Documentation of traditional character
- Availability of composition data with focus on bioactive substances
- High consumption
- Health implications
- Marketing potential





1.2. Selection of traditional foods of the BSAC

30 (+- 20%) traditional foods will be selected

Selection workshop: during the second Consortium meeting (Plovdiv, 28-30 October, 2009).

Selected foods will represent the following categories.

- **Cereals and cereal based foods**
- **Vegetables**
- **Fruits**
- **Products from oilseeds**
- **Herbs, spices, aromatic plants**
- **Fermented products of plant origin**

The selected foods will

- **be recorded and described in detail**
- **enter the analytical (WP2) and bioactivity (WP3) characterisation tasks**



1.3. Recording and description of traditional foods

- **Implementation of recording and collection of data**
Info on raw materials and ingredients
Detailed recording of the traditional preparation method
Dietary and health promoting issues in relation to the composition
- **Development of flow charts of the traditional preparation or production procedure**
- **Development of integrated records for possible purposes of registration**



1.4. Development of a large-scale survey of traditional foods (UNIBO)

To document diversity, environmental, cultural and other issues

Documentation of an open number of foods (target at least 90)

Priorities also different from those used for food selection of 1.1.3.

Among these:

- Foods from specific crops, relevant for biodiversity characterisation and preservation
- Groups of plant origin foods from specific geographic areas and/or ethnic groups
- Groups of plant foods with similar putative healthy properties in the popular knowledge of different areas
- Groups of plant origin foods used for similar preparations in different areas
- Groups of plant origin foods of particular interest for stakeholders

Activities extended to **Armenia**, Azerbaijan, Moldova

Collected data also used for:

- the prioritisation of analytical activities, within and beyond BaSeFood
- plans for plant germplasm collection
- possible upscaling in cooperation with WP4



An example with primitive wheats

A transect from the Pyrenees to Caucasus

**In BaSeFood: Italy, Turkey, Georgia, Armenia
(L.F. D'Antuono, B. Kocaoglu, M. Jorjadze, N. Darbinjan)**

- **Sampling local populations, growing in common environment**
- **Characterising bioactives (phenolics and tocopherols)**
- **Documenting local knowledge**
- **Documenting uses**
- **Documenting foods**

Triticum dicoccum in Italy



A crop in Garfagnana



Primitive harvest, south Italy



Within-field variation,
local winter type

Quality testing: gluten discs



"New" products



Triticum monococcum and T. dicoccum in Turkey Kastamonu area



T. monococcum (siyez) field

On-farm siyez bulgur drying



**T. dicoccum (gernik)
bunches loading**



**T. monococcum cooking
for bulgur**

**Tasting different sorts of
siyez bulgur**



Primitive wheats in Georgia

- **T. carthlicum is presently being reconsidered**
- **Hulled species likely present in remote mountain areas (exploration in course)**
- **special local breads prepared**
- **also gruels similar to bulgur and pilaf**



Triticum carthlicum (dika), Samtskhe Javakheti



Triticum carthlicum



Traditional bread preparation

Triticum dicoccum in Armenia

Armenia: a "hulled wheat paradise"

T. dicoccum mainly for pilaf (6000 ha)

T. compactum mainly for bread (5000 ha)

Both still traditional and usually grown



Triticum dicoccum area, Geghama range



Triticum dicoccum processing for pilaf



Triticum dicoccum pilaf, Erevan market



1.5. Food indexing

The foods considered will be indexed according to LanguaL

- a training course for the BaSeFood participants is organised by IFR and IMR
- will be held in Belgrade, November 9-11, 2009



WP2. Bioactive components, nutritional and microbiological characterisation of traditional foods

leader: INSA, Lisbon - Dr. Helena Soares Costa

2.1. Establishment of a prioritized list of bioactive compounds with putative health benefits
using **EuroFIR** and bioactive databases and other published information sources

2.2. Establishment of common methodology, sampling strategy and delivery of samples
Training seminar at second Consortium meeting (Plovdiv, 28-30 October, 2009).



2.3. Chemical determination of bioactive compounds and nutritional composition in BSAC traditional food samples

- Proximates: water/moisture; ash; total nitrogen (for protein), total fat and individual fatty acids (SFA/MUFA/PUFA), cholesterol, starch, total sugars, and dietary fibre.
- Minerals & trace elements: Na, Fe, Zn & Se.
- Vitamins: A, E, C & B2 and folic acid/folates
- key bioactives

Use of the EuroFIR methodology for recipe calculation

comparison to analytical data



2.4. Indication of main microbiological risk and beneficial factors of BSAC traditional food quality and processing (fermentation) (UZHNU, Nadiya Boyko)

- Detection of key microorganisms for food quality / food safety
- Detection of key microorganisms involved in food processing



WP 3. Health-promoting properties, absorption and bioactivity of target components

leader: IFR, Norwich - Dr. Paul Kroon

3.1. Preparation of a database of *in vitro* bioactivity data for typical BSAC foods and bioactives

- **Antioxidant activity (ABTS method) – UniBO**
- **Platelet aggregation (Platelet Function Analyser-100) – IFR**
- **Bacterial population dynamics (conventional colony-counting) – UZHNU**

3.2. Quantifying the effects of food extracts / bioactives on markers of vascular function / CVD risk

The following models will be used:

- **Neonatal rat cardiomyocytes (UniBO) – 4 BAS only**
- **Human hepatoma cells, HepG2 (UniBO)**
- **Human vascular endothelial cells, HUVECs (IFR)**
- **Human dendritic cells (UZHNU)**
- **Human leukocytes and platelets (IMR)**



3.2. Quantifying the effects of BSAC food extracts / bioactives on the gut flora and gut immune function

This task is concerned with the ability of the extracts / compounds to modulate and regulate host immune defences and the gut microbiome.

- **Changes in gut microbial homeostasis**
- **Modulation of host immune defences**

3.3. Clinical trials to quantify the bioavailability and efficacy of selected BSAC foods

This task comprises 2 major intervention studies.

- **One will be conducted at IMR, Belgrade. Principal outcome: Platelet aggregation**
- **One at the Transcarpathian Regional Cardio-Centre. Principal outcome: in vivo measure of endothelial function**



WP4. Technological-chain effects on bioactives in traditional foods

leader: ONAFT, Odessa - prof. Sergiy Fedosov

4.1. Preparation of a list of selected foods and critical processing unit operations

On the basis of the results of initial phases of WP1 and WP2, and extensive literature review

4.2. Determination of yield and retention factors of bioactive components

- 7-8 traditional foods from different food categories**
- key bioactive compounds for each selected food**
- actual yield and retention factors will be estimated, in relation to technological parameters**



4.3. State of the art about the impact of processing on bioactives and nutrients in different groups of traditional foods of plant origin

- Effects of processing on bioactives and nutrients in fermented foods.
- Effects of processing on bioactives and nutrients on juices
- Improvement of processing halvà using different oilseeds of the BSR
- State of the revision of flow charts of traditional bread products.

4.4. Optimising critical unit operations and / or technological or raw material supply scheme

- Technological and flow chart optimisation for bread, juices, oilseed products, fermented products
- Raw material characterisation (variation) of cereals, vegetables, oilseeds

4.5. Testing of new flow chart(s) for production at catering and SME industrial levels

- New bread product with increased nutrition and health properties.
- New improved product from oilseeds.
- New vegetable or fruit based product enriched with bioactive components.



WP5. Chain development and consumer issues in health-promoting traditional foods

leader: ASE, Bucharest - prof. Carmen Costea

Objectives

Perception of traditional food of the Black Sea area in a healthy context among consumers and stakeholders

Specific

- **to explore the opportunities given by the combination of traditional and health promoting properties by means of a multi-stakeholder, chain-approach, investigation**
- **to determine consumers' perception and expectations of Black sea area local traditional foods among consumers and processors, by means of questionnaire-based surveys**



Several common points with TRUEFOOD (coordinated by SPES-GEIE), workpackage 1: Determination of consumer perception, expectations, and attitudes, from which methodologies will be share

5.1. Elaboration of consumers / expert healthy food concepts from traditional foods

- **define the potential of different combination of carriers/ health claims, and assess the validity of traditional / health promoting food combination**
- **define the correspondence of expert judgement with consumers expectations**

5.2. Analysis of traditional food perceptions of populations of the Black sea area and Western Europe.

- **compare the attitude of Black sea area consumers towards traditional foods in relation to their social and contextual status**
- **individuate priority traditional foods in the local context**
- **individuate priority Black sea are foods of interest for western context**



Work package 6. Dissemination leader: UNIBO, prof. L. Filippo D'Antuono

Objectives

To achieve the maximum impact of project's results

Specific

- to produce a well tuned dissemination master plan (SPES- GEIE)
- to establish a means of communication for beneficiaries through the **BaSeFood Website** (www.basefood-fp7.eu) and make the Website an instrument for further communication and organisation of dissemination events
- to make available the results of experimental work on nutritional values and health claim supporting possibilities of the food examined through the **EuroFIR database** and other dissemination tools
- to **involve stakeholders** in the phases of planning, activities and dissemination
- to participate at, and organise specific dissemination events



Concluding remarks

Final achievements

- Contribution to the integration of approaches and methods in traditional food research and development
- Generation of reliable scientific data on food plant bioactive substances, properties and effects
- Establishment of a consolidated pool of stakeholders
- Integration of concepts and approaches for the characterisation of plant, food and cultural diversity
- To use the food message to enhance international cooperation in the Black Sea region