KBBE-2007-2-3-02: Assessment and improvement of existing food and feed technologies

Project abstract: The roasting technologies that exist today are used extensively by the food industry in many and various applications. While roasting is known to generate important and valuable components such as aroma, flavour and antioxidants it may also produces unhealthy substances e.g. acryl amide and furans. This classical technology has never been analyzed thoroughly. Its operation in many ways is based on traditional and local experience.

Our aim is to assess and improve the roasting technology as it is manifested in the coffee industry. We intend to conduct a thorough and exhaustive study of roasting from industrial processing to home preparation covering safety, nutritional, environmental and economic issues.

We propose to study various operating conditions and parameters such as roasters design and configurations, heating profiles, energy sources, type of green and moisture and their effects on generation of aroma and flavour components, antioxidants, CO2, Acryl Amid and Furans, resulting in a new approach to roasting. Moreover, we plan to develop unique operating parameters to maximize production of beneficial components and minimize development of components with adverse effect on health as well as eliminate/reduce environmental hazards associated with roasting. We will do so by developing better measurement and control systems together with innovative technologies to recycle heat and treat gases emitted during roasting.

Expected deliverables are clearly improved technologies as measured against specific indicators.

1. A new and innovative roaster, compact in size, highly efficient and controlled using sophisticated monitoring and control systems.
2. New set of conditions to enhance positive aspects of roasting such as generation of antioxidants which are know as anti aging and anti carcinogenic, and the decay of appearance of undesirables such as acryl amides and furans.
3. A new approach/system to remove hazardous components emitted for roasters without generating additional waste.
4. A method, technology and systems by which CO2 generated by heat driven reaction during roasting is controlled and reduced to minimal levels.
5. On line sensor/s to monitor various physical and chemical parameter during roasting.
6. A new heating delivery system to be integrated with existing or newly developed roaster.
7. procedures for measuring the increase of consumers' trust in new and improved food products
8. Technical best practice guides and recommendations for industry standards.

Expertise Required: Most of the participants for this proposal have already been identified. We are, however, still looking for partners in the following domains:

- **Online detection of Ochratoxin A (OTA)** – Partner will be responsible for developing and testing new in-line sensors/devices for monitoring OTA in coffee.
- **Identify, develop and test new sources of energy for roasting** – Partner will evaluate new energy sources, and develop technology for the use of such sources for improved roasting quality and its advantages in terms of savings, flexible operation and environmental safety.
- **Develop and test new technologies for reduction of air pollutants emitted by roasters** – Partner will develop and test a new air pollution control process capable of eliminating hazardous components generated during roasting which includes CO, CO2, NOx and coffee odorants.
- **SMEs are particularly encouraged to join our proposal**

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