



**LABORATORY OF WATER AND WASTEWATER TECHNOLOGY
DEPARTMENT OF FOOD TECHNOLOGY
SCHOOL OF FOOD TECHNOLOGY AND NUTRITION**

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**TECHNOLOGICAL
EDUCATIONAL
INSTITUTE OF
THESSALONIKI**



**Short term seminar:
Implementation of C2C issues in food processing companies**

Alexander Technological Educational Institution of Thessaloniki

16/05/2013

9.00-9.30	Registration
9.30-10.00	Welcome-short presentation
10.00-13.00	The C2C concept: Why, What and How!
13.00-13.30	Coffee break
13.30-14.00	Functions of food processing: Structure of production process
14.00-15.30	First materials, additives and other inputs
15.30-16.00	Lunch break
16.00-16.45	Design of production: inputs, outputs and methods.
16.45-17.00	Close of the first day

17/05/2013

9.00-10.00	Equipment and Energy management
10.00-11.30	Waste management
11.30-12.00	Environment-Biodiversity
12.00-12.30	Coffee break
12.30-13.00	Health, safety and training of personnel
13.00-14.00	Presentation of the C2C game
14.00-14.30	Lunch Break
14.30-16.00	C2C game
16.00-17.00	Discussion-Conclusions

Activities report form

Activities: Training of food Scientists in C2C concept: the food handler approach.

Date: 16-17/05/2013

Place: TEITHE

Activities (description of workshops, lectures, work etc.)

Training workshops using interactive presentation of Cradle to Cradle concept. The program includes detailed approach of C2C tailored on the specific needs of the activity. For processed food production the production methods and practices are the one which should be revised and appropriately redesigned. Traditional food processing was designed long ago and few alterations have been made. More of them concern the additives and far less concern the utilization of first materials.

The program contained:

Day 1

- Presentation of C2C concept
- Circular economy
- Functions of food processing
- Design of production

Day 2

- Equipment and energy
- Waste managements
- Environment, biodiversity
- Health safety and training of personnel
- Simply Cycle Game (presentation and play)
- Open discussion – Suggestion for future work

Results (contacts, action plans, documents etc.)

All participants were introduced to a new perspective. The trainers effort was focused on presenting the fact that there are no such things as "waste" but there are only procedures to be upgraded and useful products to turn bi-products into.

Conventional industry following the linear economy has a starting point or an input, and a finishing point or an output where products are produced as well as waste is produced also.

The biggest challenge for today's industry is to find ways to produce more and of bigger added value products and to minimize or zero the waste.

All this should be accomplished by consuming less energy which should be of renewable sources. A big issue is other materials used by food processing companies such as packaging materials. They are waste that is not obvious in production sites but can contribute a great amount of total urban waste. Novel environmental positive, easy to use, functional and safe materials should be developed.

Related document: **Food processing suggestions report**.

Learning outcomes (what input has been delivered for your organisation and for yourself)

The food scientists training session made it clear to the trainers that there is a need for novel approach for every individual food processing process.

For first materials there should be improvements in terms of environmental and economic performance.

Methods used should be upgraded in order to have more, novel, of bigger added value products at lower environmental and waste management cost.

Biological cycle should accept only those remains that cannot practically be utilized for any other product.

Packaging materials should be improved in order to provide safety for people and the environment but there should be the lowest possible waste management cost.

All agreed that the food industry is ready to proceed in adoption of C2C concept in their operation. However there is a big gap in information that can be provided and also there is a need for specialized personnel capable of introducing and implementing C2C.

Agreements (what have all parties present agreed upon)

All recognize that currently applied practice is no longer sustainable and linear economy should be abandoned giving place to circular procedures.

All agree to make an effort to introduce to food industry as pilot implementation in the beginning the C2C approach. Therefore they have agreed on collaboration for future pilot projects for practical implementation of C2C in commercial scale production companies.

All of them are willing to contribute each from his/her own expertise for the improvement of specific methods, procedures and materials.

However all of them feel they should have a strong reference point they can address to discuss and find technical solutions to problems that will arise during C2C implementation in food companies.

Contribution (description of own contribution to the activities)

The trainers have attempted to transfer the knowledge, inspire the attendants and give them the appropriate initiatives and triggers so that the training would be more interactive and the trainees would contribute the best of themselves in terms of knowledge and enthusiasm.

All attendants agreed to make an effort to communicate C2C to their clients. They also want to be actively involved and they want to know how they can contribute and which the most efficient way to get appropriately trained is.

All their reactions and contribution to work was concentrated, processed and is recorded in **Food processing suggestions report**

Remarks

It is obvious that the food companies are ready to proceed in changes in procedures, materials and final products. The linear economy is leading to a dead-end in terms of economic viability, environment and quality of life. Also the differentiation from competitors especially those who are located out of European Union which will serve as competitive advantage is always wanted.

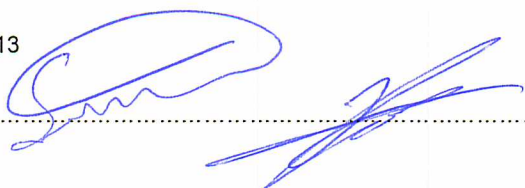
Name: Petros Samaras, Ilias Kalfas

Organisation TEITHE

Place Thessaloniki

Date 21/05/2013

Signature



Food processing suggestions report

This report contains the suggestions that have been made by the C2C training attendees concerning the cradle to cradle implementation, problems and perspectives.

First materials, additives and other inputs

In food industry the choice of first materials is of great importance for the qualities of final products. There are more than one options when it comes to additives, preservatives etc. The selection that will be made depends on many factors such as qualities of final products, customer demands etc. C2C approach demands that the waste created in production process should be used for the production of other products and only when that is not feasible organic material should be incorporated into biological cycle.

Design of production: inputs, outputs and methods.

Inputs selection can be of critical significance for the products. However the output is also important. *A company may differentiate its production line and have more products or develop a novel one which can take advantage of materials that were considered to be "waste".*

Packaging materials should be redesigned in order to reduce resources waste and pollution. The only way to handle waste effectively is to stop in in the source or not to create it at all. New packaging materials should be practical, low cost, effective and easy to enter the biological cycle after use.

Equipment and Energy management

Equipment is sometimes responsible for pollution. Appropriate maintenance should be provided in order to reduce any emissions. Also the available equipment defines methodology and followed practice. Novel products and novel packaging require new, more sophisticated equipment, which will be more effective and energy efficient.

Waste management

The improvement and redesign of production will allow a company to reshape its position and its financial results in the market. For example an olive oil plant can make bigger income by olive high added value by-products such as polyphenols, than what it makes by the main product, olive oil.

Environment-Biodiversity

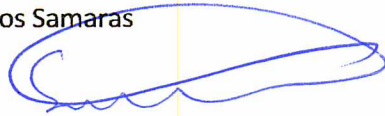
The environmental performance of food industries are of great importance nowadays and one of the factors that affect consumer decisions. Companies that promote environmental protection are preferred by consumers. In the concept of

environmental protection we can include the use of indigenous rare plant varieties that can be used for the production of processed food products. Only if these varieties are supported by the industry they will manage to survive and be inherited to coming generations.

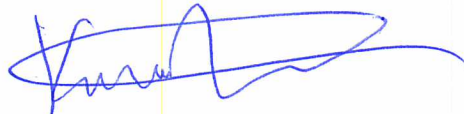
Health, safety and training of personnel

For the successful implementation of C2C in food industry there are some conditions that have to be fulfilled. C2C oriented alterations of methods and material should assure that there will be no hazard for health and safety of consumers and personnel. In order to implement C2C the personnel of any company should be appropriately trained. They have to know exactly what the adaptations are, which the reason is for each one of them and how this is technically feasible to be accomplished.

As. Prof. Petros Samaras



Dr. Ilias Kalfas

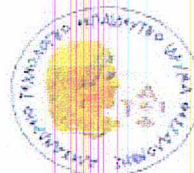




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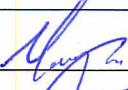
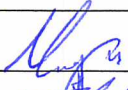
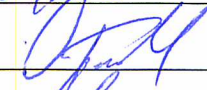
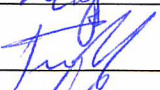

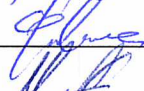

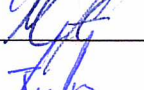
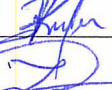
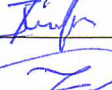
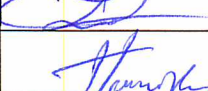
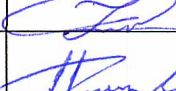
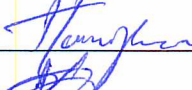
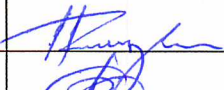
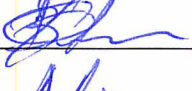
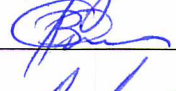


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Short term seminar: Implementation of C2C
Seminar Attendance Form

Place: TEITHE

NAME	DATE: 16/5/2013	DATE: 17/5/2013
NIKOS MARGARITOPOULOS		
GIORGOS MARGARITOPOULOS		
PETROS FELESAKIS		
ELENA MALIOKA		
IOANNIS KALTSIS		
VASILIS ZAFEIROPOULOS		
TRYFON PAPANTONIOU		
VASILIS FASSAS		
ANDREAS DERSIVIS		

Trainer(s):

ILIAS KALFAS

