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Project acronym	BASELINE
Project title	Selection and improving of fit-for-purpose sampling procedures for specific foods and risks
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Del. No.	*Deliverable name*	*WP No.*	*Lead participant*	*Nature*	*Dissemination Level*	*Due delivery date from Annex I*
D6.2	Identification of relevant environmental factors: primary and secondary modelling	6	DKFZ		PU	M24

Delivery date	31/07/2011
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SEVENTH FRAMEWORK PROGRAMME

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Executive summary

Microbial growth in food products is greatly influenced by environmental conditions concerning the food matrix, microbial characteristics (intrinsic factors) and extrinsic factors such as temperature, pH, water activity (a_w), processing time etc. The main objective of investigating environmental factors in food preservation is to inhibit microbial growth, shorten the microbes' survival or cause their death. To achieve such control many factors must be evaluated for each specific food within the Hazard and Analysis of Critical Control Points (HACCP) system.

Environmental conditions can affect largely the microbial load along the food chain. Factors underlying those conditions can be classified in four major categories:

- Physical factors, such as temperature, food matrix
- Chemical factors, such as pH, preservatives, etc.
- Biological factors, such as competitive flora, production of metabolites or inhibiting compounds etc.
- Processing factors, such as cross-contamination events etc.

Deliverable 6.2 belonging to BASELINE project is related to the "Identification of relevant environmental factors" within the microbiological food/risks combinations selected through the use of predictive modelling approaches. The results presented below corresponded to the work performed up to the 24th month and they are related to the sub-task 6.2.4 "Food risks factors identification".

The main objective of this task was the evaluation of the most representative factors that can have an influence on the final risk. To do so, a clear description of the modelling framework within each food/risk combination is presented. Afterwards, a selection of key-processing steps along the food chain is intended to be considered for the application of predictive models. This often requires a good understanding about the physico-chemical factors presented in the food that can contribute to growth or inhibition of pathogens.

The information generated in the sub-task 6.2.4.together with the characterization of microbial distributions in the food will be the input variables for the application of predictive models and the subsequent estimation of the microbial risk associated. The evaluation and optimization of sampling schemes will be performed based on the risk reduction they pose in the food matrix selected.

Deliverable 6.2 has been described as follows:

- The selection of food/risks combinations to be modelled in the project is presented, together with the responsible partners associated to each one.
- A description of the information to be collected from partners in WP1-5.
- The effect of the most representative extrinsic and intrinsic factors on microbial growth/inactivation.
- The primary and secondary models considered from D6.1.
- The literature review and work performed for selected food/risks combinations and application of predictive models and statistical approaches to prevalence and concentration data.

Selection of the scope (food/biological risk combinations) to be modelled for the evaluation of microbial sampling schemes

In the 24-month period of the BASELINE project, WP6 partners could identify the most relevant environmental factors in the food matrices selected by all BASELINE project partners concerning biological risks, in order to apply predictive growth/inactivation/survival models for the evaluation of microbial sampling schemes.

Out of the total of 40 food-biological risk combinations selected by BASELINE project partners' 1-3 representative combinations per each of the five products oriented WPs (WP1-5) have been selected for modelling purposes as presented in Table 1. The selection was guided both by the needs expressed in the respective WPs, their available resources, and by the general concept laid down in the subtask 6.3 of WP6.

WP	Product	Type of product	Biohazard	Partners involved
1	Smoked salmon (cold/hot)	Minimally processed	*Listeria monocytogenes*	NVI, UN, TEAGASC
2	Whole eggs	High volume/minimally processed	*Salmonella enterica*	UNIBO, VETFAC, ANSES
2	Pasteurized eggs (whole liquid and yolk)	High volume/highly processed	*Salmonella enterica*	UCPH, TIHO, ANSES
3	Unpasteurized cheese	Niche/minimally processed	*Listeria monocytogenes*	ITACyL
3	Semi hard or hard cheese	Niche/minimally processed	*Listeria monocytogenes*	VETFAC, ITACyL, TEAGASC, UNIBO
4	Poultry products	High volume/minimally processed	*Campylobacter* spp.	UNIBO, TIHO, ANSES, ITACyL
4	Pork cuts	High volume/minimally processed	*Salmonella enterica*	UNIBO, CST, ITACyL, TEAGASC
4*	Ground beef	High volume/minimally processed	*Escherichia coli* O157:H7	TEAGASC
5	Lettuce pre-cut RTE salad	Minimally processed	*Listeria monocytogenes*	UN, UCO
5	Lettuce pre-cut RTE salad	Minimally processed	*Escherichia coli* O157:H7	UN, UCO

Table 1. *Selection of food and biological risk combinations for modelling purposes.*
** This food/risk combination is subjected to data availability as well as time and resources to be modelled*

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