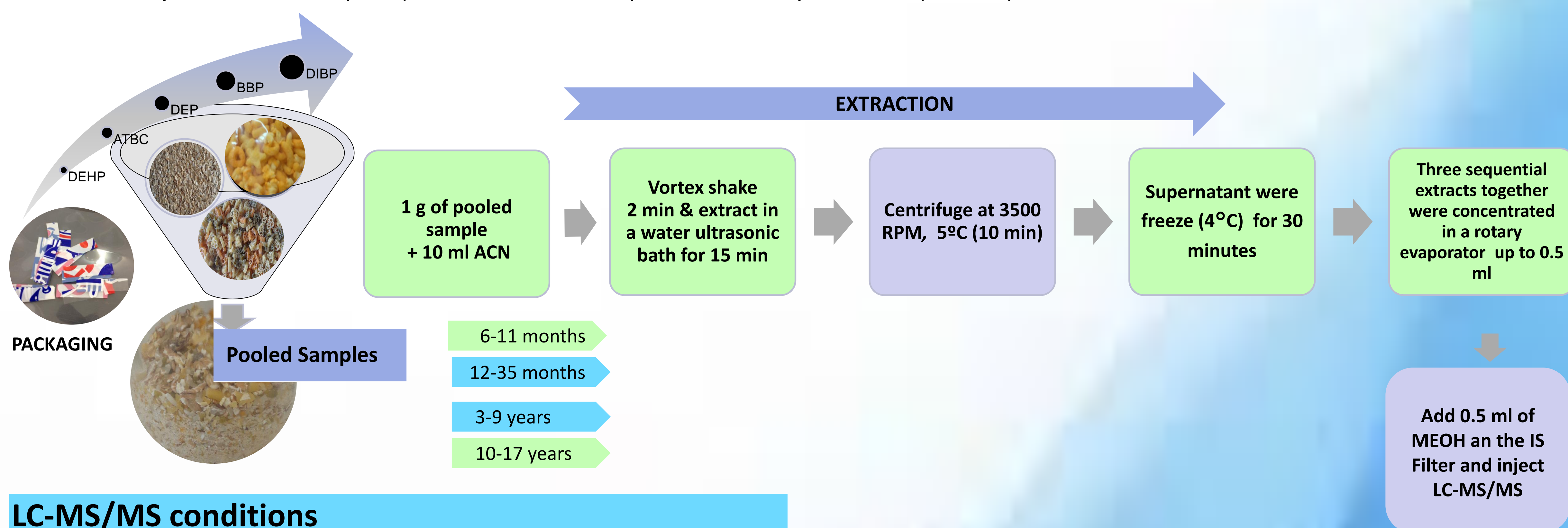


Introduction

Some chemicals present in food may pose a health risk to the consumers. People are exposed to contaminants, through several sources and it is recognized that food packaging may be a potential source of contamination, through the migration of contaminants substances from the packaging into the food. The monitoring of this migration has become a priority issue in order to ensure the food safety. Total diet studies are an effective tool to estimate the levels of the population exposure to different chemicals, allowing the subsequent adoption of appropriate measures in order to protect the safety of consumers [1,2]. This work present the results concerning the determination of some plasticizers in cereal based foods, contained in plastic packaging, and the estimation of the exposure. The analysed plasticizers were previously identified in the packaging itself: acetyl tributyl citrate (ATBC), diethyl phthalate (DEP), benzyl butyl phthalate (BBP), bis(2-ethylhexyl) phthalate (DEHP), diisobutyl phthalate (DIBP) and dibutyl phthalate (DBP).

Experimental

The foodstuffs, rice, pasta, breakfast cereal, bread, were pooled into four groups according to the population age (6-11 months, 12-35 months, 3-9 years and 10-17 years) and based on the Spanish consumption data (ENALIA).



LC-MS/MS conditions

Instrument: HPLC-MS/MS (Thermo Fisher Scientific, San José, CA, USA).
Column: Kinetex biphenyl (100 x 3.0 mm, 2.6 µm particle size) at 30°C.
Mobile phase: Methanol with 0.1 % (v/v) formic acid/ Water with 0.1 % (v/v) formic acid
Flow gradient : 0.4 ml/min.
Injection volume: 10 µl
ESI: positive
Sheat gas: N₂
Collision Gas: Ar
Quantif Trace: DEP (223.1 >149.1), DIBP (279.2 > 149.0), DBP (279.2 > 149.0), BBP (313.1 > 91.1), DEHP(391.3 > 149.0), ATBC (403.2 > 129.0), DEPd(227.2 >153.1)



Results and discussion

Only DEP, DIBP and ATBC were found in all pooled samples. Exposure was assessed by combining the concentration of compounds with the food consumption data reported in ENALIA Spanish survey

Concentration of compounds in selected food groups					Dietary exposure			
Compound	µg/g				µg/kg bw per day			
	6-11 months	12-36 months	3-9 years	10-17 years	6-11 months	12-36 months	3-9 years	10-17 years
DEP	0.221	0.118	0.0839	0.0608	0.708	0.308	0.196	0.060
DIBP	< LOQ	< LOQ	< LOQ	< LOQ	0.270	0.0581	0.155	0.0353
ATBC	0.479	0.262	0.508	0.432	1.702	0.682	1.192	0.498

In general, ATBC mean exposure was higher than those for phthalates in the four groups of age analyzed

Conclusions

The proposed LC-MS/MS method is adequately sensitive and satisfactory in terms of precision and accuracy for detection and quantification of the selected compounds.

Although the levels found were low it is important to consider that migration of chemical compounds from food packaging materials are a source of exposition and can reach a risk to public health and safety

Further research is ongoing aimed at evaluating the exposure derived from the consumption of other types of packaged food products.

References