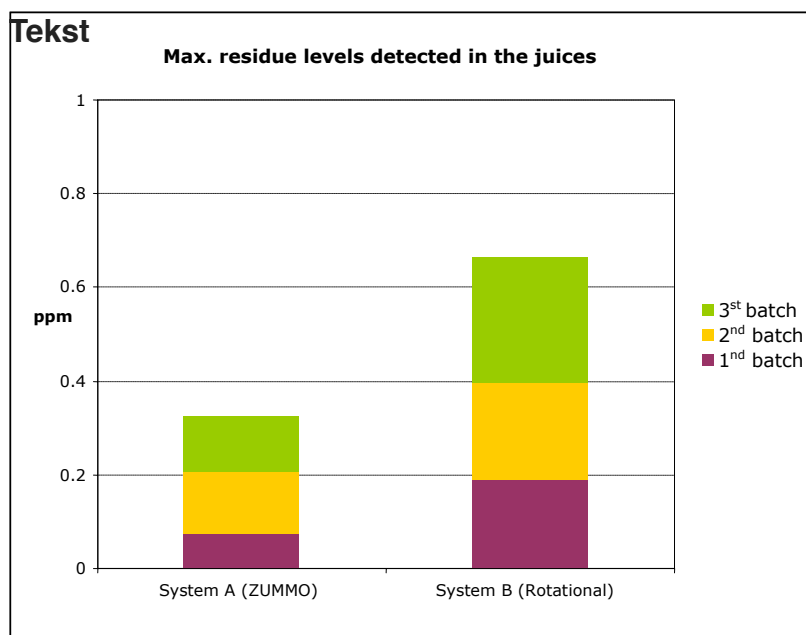


SUMMARY OF RESULTS FROM THE CHEMICAL ASSESSMENT STUDY OF ORANGE JUICE SAMPLES OBTAINED FROM VARIOUS JUICING SYSTEMS

This document - prepared by AINIA (a research and technology centre specialised in the food sector) at the request of the ZUMMO company - is a summary of the results from a comparison of the automatic juicing systems assessed in the "Chemical assessment study of orange juice samples obtained from various juicing systems", a study carried out at the request of said company.

The automatic systems under study were the ZUMMO system (automatic vertical system) and system B (automatic rotational system), using equipment provided by the company requesting the study. After carrying out the process of orange juice extraction with both systems, the samples were analysed to determine the residual pesticide content in each. Ainia has been certified by the ENAC - Entidad Nacional de Acreditación, or National Accreditation Entity, for the residue pesticides analyses performed in this study.

SUMMARY OF RESULTS: With the juicing equipment in continual operation mode, the ZUMMO system showed lower levels of pesticide residues than system B (rotational system) for the different juicing process points under analysis (3 batches of 10 kg each.) Said residue levels were observed to be from 25-153% lower in juice from the ZUMMO system than that produced with system B.



The following points regarding the method used in this study are worth noting: The fruits under study were navel variety oranges from the same batch, with detected pesticide residue levels of ethyl chlorpyrifos (0.03ppm), methyl chlorpyrifos (0.03ppm), Imazalil (1.94ppm) and Thiabendazol (1.14 ppm), and a calibre of between 55 – 75mm. Various juicing tests were carried out with these oranges. Two automatic juicing systems (ZUMMO system - a vertical juicing system, and system B - a rotational juicing system) along with a manual squeezing system were used for these tests. Juice samples were taken in duplicate at three distinct points during the process in continuous operation mode.

NOTE: The quantities of pesticide detected in all cases were below the maximum residue limits (MRL of fresh produce) set by current European law, given that they are below the 5% established by the European Union for said active material.