



RELEASE OF HYDROCARBONS FROM FRESH CHEESE PACKAGING

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MOCA:

“Materiali e Oggetti a Contatto con Alimenti” are defined as materials and objects directly in contact with food (cooking utensils and tableware, containers, machinery for food processing, packaging materials...)



The MOCA regulation only provides a limit of total compounds migration from packaging to foodstuffs of **60 mg/kg of food**.

Volatile or trace-level compounds are not detected!

Analytical method:

Extraction of VOCs from packaging and food using **Purge and Trap** → Analysis in **GC-MS**

Aim of the work:

Identify the release of volatile substances from dairy plastic packaging.

Samples:

- Samples of dairy products packed in opaque and transparent PE / nylon bags
- Samples of yoghurt in polystyrene jar



Qualitative analysis results

- Mozzarella cheese and packaging → benzaldehyde, alcohols and ketones, aromatics and aliphatic hydrocarbons, in particular **isododecane**
- Yogurt and packaging → toluene, xlenes, propyl - benzene, ethyl - benzene, in particular **styrene**

Quantitative analysis: Isododecane and Styrene quantification

Isododecane in packages	Conc. ng/g
Sample 1	53
Sample 2	16
Sample 3	10
Sample 4	88
Sample 5	38
Sample 6	448
Sample 7	114
Sample 8	2
Sample 9	14
Sample 10	10
Sample 11	1870
Sample 12	919
Sample 13	1053
Sample 14	1683
Sample 15	98
Sample 16	181
Sample 17	337
Sample 18	0.2
Sample 19	31
Sample 20	84
Sample 21	20

Isododecane in mozzarella cheese	Conc. ng/g	µg for mozzarella
Sample M1	3.2	0.641
Sample M2	3.1	0.628
Sample M3	0.16	0.041
Sample M4	0.19	0.046
Sample M5	0.043	0.009
Sample M6	0.04	0.008
Sample M7	0.22	0.022
Sample M8	0.2	0.017
Sample M9	0.1	0.011
Sample M10	0.2	0.019
Sample M11	0.22	0.028
Sample M12	0.20	0.026

Sample	Styrene in packages Conc. ng/g	Styrene in yogurt Conc. ng/g
Sample S1	40	0.03
Sample S2	235	0.02
Sample S3	467	0.4
Sample S4	420	0.4
Sample S5	520	0.3
Sample S6	392	0.4
Sample S7	662	0.3
Sample S8	1137	0.3
Sample S9	162	0.09
Sample S10	35	0.04
Sample S11	13	0.05
Sample S12	53	0.13
Sample S13	62	0.08
Sample S14	3	0.05

Conclusions

- Aliphatic and aromatic hydrocarbon compounds were found in all analyses.
 - The higher concentration of these compounds were found in packaging, even though these don't overtake MOCA law limits.
 - Hydrocarbon compounds diffusion from packaging into foods is low.
- Nowadays MOCA don't establish specific limits for these suspected carcinogenic compounds. However, more restrictive limits should be required for them.

