



Executive Study – LCA Food Packaging / Fish Box, Executive Summary

EPS Fish boxes Comparative Life cycle Assessment



EUMEPS

Comparative Life Cycle Assessment of three fresh foodstuff packaging solutions



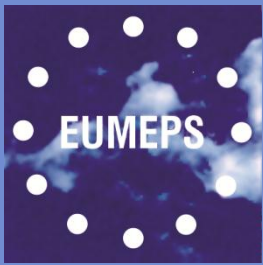


Executive Study – LCA Food Packaging / Fish Box, Abstract

When initiating the LCA on fish box, EUMEPS packaging aimed to get reliable information on the environmental performance of EPS packaging solutions. The joint expert know how of ANAPE, EcoPSE, EUMEPS, several industry partners and PwC led to important conclusions.

The analysis is based on the comparison of three packaging solutions (EPS boxes, corrugated cardboard boxes and polypropylene boxes) for fresh fish and took into account different market scenarios from Spain, France and Scandinavia.

The comparison revealed that EPS is a competitive and sustainable packaging material for fresh fish, with similar or even better results than the investigated alternatives. Generally, the production of raw materials and the transformation into packaging have the greatest input on the environment. Thus, the main improvement option for EPS fish boxes is the reduction of energy consumption during the transformation process. Furthermore, the establishment of a broad recycling system would increase the environmental performance of EPS fish box. On the other hand, transport requirements do not have an important impact on the environmental results.



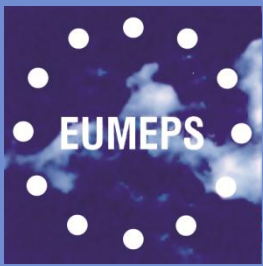
Executive Study – LCA Food Packaging / Fish Box, Method and Objectives

Objektives:

- Estimate of the environmental impacts of EPS packaging.
- Preparation of an European legislation.

Method / Data collection:

- “Cradle-to-grave” Study, respecting the whole life of packaging system
- Comparative study for several fish box packaging solutions
 - Expanded Polystyrene
 - Corrugated Polypropylene
 - Waterproofed Cardboard
- Reference-Scenarios for Spain, France, Scandinavia
 - 4 kg fresh fish from local harbor in France to local fish market
 - 6 kg fresh fish from local harbor in Spain to local fish market
 - 20 kg fresh fish from local fisheries in Denmark to international fish market



Executive Study – LCA Food Packaging / Fish Box, Comparative Results of 3 markets

Indicator	Packaging Solutions France			Packaging Solutions Spain			Packaging Solutions Scandinavia		
	EPS 4 kg	PP 4 kg	Cardboard 4 kg	EPS 6 kg	PP 6 kg	Cardboard 6 kg	EPS 20 kg	PP 20kg	Cardboard 20 kg
Non renewable primary energy in MJ	1	1.1	0.9	1	1.3	1.0	1	0.8	0.6
Depletion of Non Renewable Resources in kg eq. Sb	1	1.2	0.9	1	1.3	1.0	1	0.9	0.6
Emission of Greenhouse Gases in kg CO ₂ eq. 100 yrs	1	0.9	1.0	1	1.0	1.4	1	0.8	0.7
Air Acidification in g SO ₂ eq.	1	1.0	2.0	1	1.2	2.0	1	0.8	1.0
Photochemical Oxidants formation in g eq. ethylene	1	0.3	0.2	1	0.3	0.2	1	0.2	0.1
Water consumption in m ³	1	0.8	3.3	1	0.7	3.5	1	1.0	4.1
Water Eutrophication in in g eq. PO43-	1	1.3	5.9	1	1.2	5.3	1	0.9	2.4
Total waste production in kg	1	3.4	7.6	1	2.1	4.1	1	1.5	2.4

Remarks:

- Performance of another packaging within 20% of the EPS packaging value, the two are considered equivalent, due to uncertainties in LCA calculations.
- Performance of another packaging solution lower by more than 20% than the one of the EPS packaging, the value is highlighted in green.
- Performance of another packaging solution higher by more than 20% than the one of the EPS packaging, the value is highlighted in orange.



Executive Study – LCA Food Packaging / Fish Box, Specific Market Results

Relative impact of EPS packaging compared to other packaging systems:

- On the **French market** (4 kg boxes, 300 km transport to fish market) EPS packaging performs similarly or better than polypropylene and cardboard boxes, except for the formation of photochemical oxidants.
- Results for **Spanish Market** are comparable (6 kg fish per box, 300 km transport to fish market). Polypropylene boxes perform better than EPS regarding the formation of photochemical oxidants as well as water consumption.
- The results on **Scandinavian market** (20 kg fish per box, 1200 km transport to international fish market) compared to polypropylene and cardboard boxes are balanced.



Executive Study – LCA Food Packaging / Fish Box, Main Results / Main Recommendations

The main results of the LCA are:

- Two main stages of the life cycle of fish box considered to have the greatest impact upon the environment:
 - Production of Raw Material
 - Transformation of main packaging
- Transport, even over long distances, plays a secondary role.
- Weight of packaging is the key parameter in the fish packaging system. Each weight reduction will play a tangible role.

Recommendations to improve the results for EPS packaging:

- By reducing the energy impact of 68% in the transformation process, EPS would perform significantly better than cardboard and polypropylen boxes.
- An optimized end of life recycling ratio would potentially help to achieve this goal.



Executive Study – LCA Food Packaging / Fish Box, Contact

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