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Results of the Focus Groups: Industrial Symbiosis Remains an Untapped Potential

Between November 2025 and January 2026, the focus groups on industrial symbiosis planned within the European project SYMBIOS were carried out. Their objective was to identify sector-specific trends in industrial symbiosis for the two sectors involved—agri-food and leather—and to define the areas of investigation for the subsequent needs analysis. This article presents the outcomes of the focus groups.

Industrial symbiosis is emerging as one of the most promising levers for accelerating the circular transition of the agri-food sector. This was the key message from the two focus groups held between December 2025 and January 2026 within the SYMBIOS project. The sessions were designed and led by partner IATA CSIC, with organizational support from partner GZS CCIS CAFE, and involved companies, universities, research centres, and experts in sustainability and innovation. A shared vision emerged from the discussions: industrial symbiosis is not limited to the exchange of by-products, but also includes the sharing of energy, heat, water, skills, infrastructure, and knowledge. In other words, it is about creating value together by transforming what is currently considered waste into a resource for someone else. Numerous concrete examples confirm this potential, including the use of whey, brewers' spent grain, or agricultural by-products for biogas production, animal feed, bioactive extracts, or functional ingredients; collaborations between companies and universities to develop new materials, sustainable packaging, or high-value applications; and even forms of "logistical symbiosis," such as shared transport for exports.

However, large-scale adoption remains limited. The main barriers identified are regulatory, particularly in the food sector, where safety requirements make the reuse of by-products complex. Additional challenges include fragmented supply chains, difficulties in achieving sufficient volumes, poor traceability of by-product flows, and the gap between research and the market: many solutions remain at low technology readiness levels and are therefore considered too risky for companies to adopt. Another key issue concerns the lack of connections. Companies often do not know who could make use of their by-products, nor which skills or technologies are already available. For this reason, participants stressed the urgent need for dedicated platforms capable of facilitating matchmaking between companies, research institutions, and other sectors, supported by feasibility studies and financial tools.

The final message is clear: ideas and opportunities abound but turning industrial symbiosis into a widespread and structural practice requires stronger coordination, more enabling policies, targeted investments, and a shift in mindset. Only then can the agri-food sector fully express its role in the circular bioeconomy.

Equally interesting are the results of the two focus groups held in November 2025 for the leather sector, designed and conducted by partner SPIN 360 with the organizational support of partner

COTANCE. The leather sector is, by its very nature, one of the clearest examples of industrial symbiosis: leather originates as a by-product of the meat and dairy supply chains. This awareness provided the starting point for the two focus groups, which aimed to analyse practices, challenges, and opportunities related to industrial symbiosis within the leather value chain.

The discussions revealed a clear picture: the valorisation of by-products is already an integral part of the sector, but its potential is still not fully expressed. Today, only 20–25% of the mass of a hide is transformed into finished leather; the remaining 75–80% requires alternative valorisation pathways, such as fertilizers, gelatine, collagen, bio-materials, or technical applications. The real challenge is intercepting these flows at the right moment, preserving their quality and value.

Cooperation between slaughterhouses and tanneries plays a crucial role. Practices adopted in the early stages—skinning, cleaning, and trimming—determine material yields, leather quality, and the potential for by-product recovery. Better upstream coordination can improve process efficiency, reduce the use of chemicals, and direct each part of the hide towards the highest-value application. Nevertheless, obstacles remain. Regulatory barriers, particularly the classification of by-products as waste, limit exchanges between sectors and the circulation of materials. Additional challenges include logistical difficulties, supply chain fragmentation, price volatility, and market demand that often fails to reward quality and circularity. Communication is also an issue: leather is frequently perceived negatively, while its biogenic, durable, and circular nature struggles to gain visibility in public debate. The focus groups, however, highlighted important opportunities, including new tanning agents derived from agri-food residues, energy recovery, non-food applications for chromium-containing residues, the selective use of different parts of the hide, and stronger integration with the agri-food and bioeconomy sectors.

To scale up these models, more coherent policies, economic incentives, clear environmental assessment rules, and investments in skills are needed. The conclusion is unequivocal: industrial symbiosis is not an option, but a strategic lever for the future of the leather sector. Transforming fragmented practices into a coordinated system means strengthening the competitiveness, sustainability, and resilience of a key sector of the European economy.