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Industrial Symbiosis: Turning Waste into Opportunity

Leather has always been more than a material. It is a story of transformation — of turning what would otherwise be discarded into something beautiful, durable and highly valuable from both circular economy and fashion perspectives. Yet today, much of leather's potential remains untapped. That is where **industrial symbiosis** comes in.

Leather: circular by nature, innovative by choice

Leather itself begins its life as a by-product of the meat and dairy industries. Without leather, millions of hides and skins would become waste, left to decompose and [emit significant greenhouse gases](#) over time. Through craftsmanship and technology, tanneries transform this residue into a beautiful — and, most importantly, natural and durable — material that supports jobs, cultural heritage, and bioeconomy. Leather-making is a fascinating blend of craftsmanship, sciences and art considering the myriad of colours, textures and designs that you can obtain.

But circularity does not stop at leather alone. Along the way, the process generates other valuable by-products — hair, fleshings, fats, collagen-rich materials, shavings, and trimmings — many of which already find second lives in fertilisers, cosmetics, gelatine, collagen, pet food, and technical applications. **The challenge is not technology: the sector has been innovating for centuries. The challenge lies in coordination and information sharing.**

Why cooperation matters — starting upstream

As part of the SYMBIOS project, we brought the leather community around the table — twice. Two dedicated focus groups gathered experienced voices from across the global leather value chain, from the livestock and meat sector to tanneries and downstream users. Together, they shared real-life practices, challenges, and ideas on how the leather-making process can become more circular and more closely interconnected with the agri-food sector and/or other industries, such as chemicals, pharmaceuticals, construction or paper.

One of the strongest findings of the SYMBIOS focus groups is clear: **the greatest opportunity for circularity lies upstream, at the interface between slaughterhouses and tanneries.**

How hides are removed, cleaned, trimmed and classified in the very first stages determines:

- the quality of the leather,
- how much usable material is recovered,
- and whether by-products can be valorised — or become waste.

Better cooperation at this stage means:

- higher usable hide yields,
- fewer chemicals used later,

- better-quality inputs for leather, collagen and fertilisers, etc.
- and more value generated by every animal — economically and environmentally.

Industrial symbiosis, in other words, is not an add-on. It is a multiplier.

What holds symbiosis back?

Despite its potential, industrial symbiosis is not yet fully realised. The focus groups identified recurring barriers:

- **Economic:** markets often fail to reward higher-quality hides or upstream pre-processing.
- **Regulatory:** complex waste rules and unequal treatment of natural vs synthetic materials discourage circular solutions.
- **Logistical:** high dispersion and low quantities of secondary feedstock generation and long transport distances make collection, recycling and processing harder.
- **Skills & knowledge:** traditional expertise in hide handling is disappearing, directly affecting quality and yields.
- **Narrative:** leather is too often labelled as "unethical" or "problematic," rather than recognised as a biogenic, circular resource.

Industrial symbiosis is already happening

The good news? The industrial symbiosis is already taking shape.

From bio-based tanning agents made from agrifood residues (grape pomace, olive leaves, avocado pits) to new uses for chromium-containing residues, the leather industry is proving that leather can go even further in the circular bioeconomy. **What is needed now is scale, alignment and trust across sectors.**

How SYMBIOS makes the difference

The **SYMBIOS project** was created precisely to unlock this potential.

By bringing together tanneries, slaughterhouses, agrifood actors, researchers and policymakers, SYMBIOS aims to:

- map real industrial symbiosis practices and identify new ones,
- rebuild cooperation between key actors,
- develop replicable models that work for SMEs,
- support skills, data-sharing and better policy alignment,
- and ensure that **nothing is wasted** — neither materials, nor opportunities.

From fragmented practices to a shared system

Industrial symbiosis already exists in leather. The challenge now is to move from isolated solutions to a **coordinated system** — one that rewards cooperation, values natural materials fairly, and strengthens Europe's circular bioeconomy.

Leather shows us that waste is often just **untapped value**. SYMBIOS is about turning that value into opportunity — for people, for industry, and for the planet.