

The New Challenge of the European Leather Supply Chain in the Current Geopolitical Environment

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Abstract

Review Article

Every year around the world, tanneries valorize and ennoble about 8 million tons of raw hides and skins, a waste material from the agri-food supply chain that would otherwise be destined for disposal in landfills or incineration, resulting in the release of about 5 million tons of greenhouse gases. On the other hand, leather, an extraordinary example of valorization and conversion of a putrescible and polluting material, has a much longer use life than its substitutes and a far more favorable degradative fate for the environment. The war in Ukraine and the consequent repercussions on the international market are likely to further exacerbate the historic need for raw materials (crude and semi-finished) of the European and, in particular, of the Italian tanning industry; and tanneries in non-European (Asian and South American) countries, given the greater availability of raw hides and skins, could take advantage of this to reduce the competitiveness of EU tannery in the markets. So worrisome is the situation that one of the world's most important associations of tanning industrialists, the National Union of the Tanning Industry (UNIC-Unione Nazionale Industria Conciaria), in agreement with the European Confederation of Tanners (COTANCE), has planned, in the first months of the year 2022, to request the European Commission to limit the export of European raw/semi-processed hides and skins outside the EU borders. In such a disturbing scenario, there is a clear need to adopt countermeasures projected over the medium and long term and adequate investments, for the ever-increasing implementation of the principles of circular economy and technological innovation in order to improve the environmental, but also economic, sustainability of the leather industry.

Keywords: Leather industry, raw hides, leather goods, Russian/Ukrainian crisis.

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INTRODUCTION

The last year will unfortunately be remembered for the serious crisis that we could define as multiple: economic crisis, with a strong upswing in inflation; social, resulting from the pandemic that with its more than 15 million victims put a strain on the health systems of different countries; environmental, with climate change; and finally, the Russian military aggression against Ukraine, which, particularly in the European context, highlighted the vulnerability of the balances built over the past decades in terms of energy and raw material supply. Unfortunately, the leather sector has also been particularly affected by this critical situation, being in itself a sector that is particularly sensitive to market fluctuations. The international market for raw hides and skins, cattle – especially - and sheep and goats, is extremely fluid and complex as well as particularly sensitive to a multitude of situations that are not easily managed or predictable, such as

industrial, technological, social, environmental, as well as geopolitical.

The world leather industry represents the foundation on which a market is built, now increasingly connected to luxury, for a turnover estimated in hundreds of billions of dollars a year globally. The EU's still represents the largest supplier of leather in the international market, despite its shrinking share in world markets due to the growth of the leather industry in other areas of the world such as Asia and the Americas. It is an industry, including footwear and all others related to leather, whose turnover of 48 billion euro is possible thanks to the approximately 36,000 small and medium-sized enterprises that employ about 435,000 people.

The main European product is bovine leather, with more than 80 percent of the production, followed

by sheep and goat skins. Exotic leathers represent a niche product, only about 1 percent of the total, but very relevant in terms of value, as they are leathers in high demand by customers in the luxury segment.

The footwear, leather goods, furniture, fashion, and automotive industries represent the most important interlocutors for EU tanners, in particular:

- Footwear (41%);
- Leather goods (19%);
- Furniture (17%);
- Automotive industry (13%);
- Apparel (8%);
- Other (2%).

By-products generated from the processing of leather and hides, however, find use in other industries such as those for the production of animal feed, including pet food, fertilizer, fine chemicals (cosmetics and other applications).

European tanners have long faced two types of trade barriers:

- The export of finished leather;
- Limitations on access to raw materials, which cause the greatest impact on the competitiveness of European tanners.

Therefore, as access to raw materials has become more difficult for European tanners due to the decreased European production in recent years of both beef and slaughter rate, sourcing outside Europe's borders is crucial, even though many non-EU countries maintain export bans and restrictions on raw/semifinished hides and skins. [European Commission].

Italian Tannery Leads European Tanning Industry

The Italian tanning industry, already in 2020 was affected by the severe economic contraction, both in terms of turnover (-23%) and production (-16%) and exports (-25%), due to the Covid-19 pandemic. , Italy has the highest number of tanneries in the European Union, followed by Spain, Portugal, and France. It is an industrial reality with 1,165 enterprises and more than 17,000 employees, diversified by production type and company size, although with a clear prevalence of SMEs (Small and Medium-sized Enterprises). The high value of production has, however, allowed it to maintain its undisputed leadership at the international level, so much so that it is the leading European producer of finished leather, accounting for 63 percent of the sector's turnover at the continental level and contributing 23 percent of the global value [Sustainability Report 2021].

The sector characterized by a highly specialized territorial system has its strength and excellence in the production districts, also integrating specialized chemical companies, plant and technology manufacturers, service companies and consortia.

The Italian Tannery uses almost exclusively bovine and sheep and goat skins, destined for fashion and upholstery, in particular, 36 percent for footwear, 26 percent for leather goods, 4 percent for clothing, 16 percent for furniture and 16 percent for car interiors. Great craftsmanship flexibility, highly standardized productions, and very strict quality controls thus allow interface with highly differentiated market segments, from top of the range, to premium, to mass market.

The leadership position of the Italian Tanning Industry is the result not only of a recognized superiority of the prestige of Made in Italy, but also of a far-sighted and courageous strategy of entrepreneurial investment in quality, minimization of environmental impact and continuous search for more sustainable tanning procedures, as well as a constantly evolving stylistic research. However, every effort aimed at sustainability is, unfortunately, thwarted by the reduced availability of raw material. Italy, in fact, is by political choices and natural characteristics a country highly dependent on foreign countries in terms of both energy and raw materials, and even the tanning industry unfortunately does not escape this shortage.

It is well known that the main raw material of tanning processes is a by-product, i.e., a waste product of animal slaughter, therefore, closely related to meat production, which an upcycling process enhances into a final product with multiple applications in the market.

The national livestock population and, in particular, the number of animals slaughtered cannot meet the demand for raw hides and skins of the tanning industry, so much so that, already statistics from the late 19th century show that the amount of imported raw hides and skins compared to those exported is largely higher; the same trend, although with different numbers especially in terms of productivity related to the tanning technological evolution both in tanning procedures (fast chrome tanning vs. slow vegetable tanning) and in the level of automation, especially in mechanical operations, can also be seen in more recent statistics such as in the table that by way of example but not exhaustive is shown (tab. 1). This is the reason why the industry in the sector for several decades, also to avoid the most environmentally burdensome processing steps, has preferred to import semi-finished products, mainly in the wet blue state.

Table 1: Historical trend of import/export of raw, tanned and glove leather in Italy

YEAR	RAW HIDES (metric tons)		TANNED HIDES (metric ton)	
	IMPORT	EXPORT	IMPORT	EXPORT
1876	13926	2019	1630	771
1896	21120	8260	2150	850
2017	171390	49713	198.075 (semi-finished leathers 181653+16422 finished)	144.366 (semi-finished leathers 85696+58670 finished)
	PAIRS OF LEATHER GLOVES			
	IMPORT	EXPORT		
1876	14.700	2.626.300		
2017	12.357.166	1.339.747		

Sources: freely taken from [Truffi, 1901]; [UNIC, 2017]

But the pandemic and now also the war in Ukraine are decreeing the final demise of a historical phase in which industrialized countries made available the goods demanded by the market by having them produced or simply bought in every corner of the world. The international repercussions of the current conflict, are further exacerbating the historical need for raw materials (crude and semi-finished) of Italian tanneries, already plagued by years of competition, sometimes unfair, made up of tariff and customs barriers and limitations of various kinds that have taken, especially in recent years, much raw material away from the free market. Foreign supply of raw material accounts for more than 90 percent of the needs of Italian tanneries, and the conflict area counts for about 3.5 percent of total purchases from abroad. Ukraine was one of the main suppliers of semi-processed hides, while Italian finished leather exports to countries affected by the conflict accounted for only 1 percent of the total [Palumbo G *et al*, 2022].

The Russian market is not one of the largest for Italian fashion, but it is a strategic market. The Russian invasion practically resulted in the immediate closure of this strategic area for Italian leather products. In fact, while the Ukrainian market simply vanished as a result of the conflict, the barrier around the Russian one was raised first and foremost with European Union sanctions that, in line with those imposed by the United States and Great Britain, prohibit the export of fashion accessories priced above \$300. But, even more so, it has been raised by designer labels and groups from all segments, which have gradually suspended distribution and sales activities in the Russian Federation area. This has resulted in a double barrage as the EU sanctions ban on luxury trade with Russia not only prevents the export of finished goods to the Federation, but also the import of raw materials. While Italian purchases of raw materials in Russia and Belarus are relatively marginal, Ukraine, turns out to be in 11th place as a supplier of semi-finished skins [Procaccini R, 2022], in fact, in the first 10 months of 2021 Ukrainian wet blue imports grew 27% year-on-year and sales of Italian finished leather to Kiev marked +17%. Data on the interchange between Italy and Ukraine are compiled by UNIC's Economic Service, the UNIC (Unione Nazionale

Industria Conciaria) is the Italian National Union of the Tanning Industry, which shows that the average flow in the 2016-2020 period amounted to 10,064 tons, of which 93% semi-finished and 7% raw" [La Conceria, 2022 March 3].

Certainly, with the current uncertain geopolitical situation and with the disturbing trend toward bipolarization into blocs, the unavailability of crude on the one hand and the limitation of export markets on the other are superimposed on the creeping economic war of the raw material (crude/semi-finished) that, as already mentioned, has for many years, not always correctly, taken considerable quantities of raw and semi-processed hides and skins from the free market, particularly because of the industrial emancipation policies of emerging or already emerged countries that tend to export less and less raw and more and more finished or semi-processed hides and skins. Among other things, raw hides and skins even if preserved (green salted, dry salted etc.) do not lend themselves by their nature to excessively long storage periods, thus preventing the possibility of strategic storage, and the same is true for tanned hides and skins.

As reported in a UNIC note, to counter such criticality in purchasing, it is essential, given raw material supply difficulties, to limit European exports of raw/semi-processed hides and skins. Given the absence of similar problems in competing non-European, Asian and South American countries, these countries, in fact, stand to benefit commercially from the economic consequences of the Russian-Ukrainian conflict and the resulting geopolitical upheaval [La Conceria, 2022 March 21].

Precisely because of the geopolitical scenarios on the horizon, coordination first and foremost between UNIC-Italian Tanneries and the European confederation of national trade associations, COTANCE (Confederation of National Associations of Tanners and Dressers of the European Community), will be essential, in order to propose in the EU an integrated management of the availability of both EU and non-EU accessible raw hides and skins, as well as energy and water resources, with the Italian tannery leadership not

as an antagonistic element but rather as a dragging element of the entire European tannery supply chain : in short, the protection of the Italian tanning industry as the driving force and model of an ever deeper and ever more imperative European integration.

Further Critical Issues and Possible Countermeasures

The Italian and European tanning industries are suffering from a number of critical issues that are becoming evident, indeed exacerbated, in the course of the Russian-Ukrainian conflict and that in part represent the main vulnerabilities of the Italian tanning industry. These certainly include the previously discussed chronic need for raw or semi-finished hides and skins. We can see a certain analogy to the current crisis in the methane gas market, for which it would be necessary to procure, with mutually advantageous contracts, from areas that are not hostile due to geopolitical conditions, and agree on a community supply strategy. So, also for the raw material market, albeit with totally different relational dynamics due to the different nature of the raw material, skin is not an energy source, it is necessary to undertake a very flexible and dynamic strategy of identifying the main potential suppliers, given the poor shelf life of raw hides that does not allow to hoard stocks too far in advance. The chronic shortage of raw material was then overlaid by the severe energy crisis and the generalized increase in the costs of tanning auxiliaries and, of course, sewage disposal/depuration.

While waiting for this tragic conflict to be resolved as soon as possible, first and foremost for obvious humanitarian as well as global security reasons, and for the economic situation to stabilize , in one way or another, a series of measures, no doubt to be coordinated at the European level, aimed at the quota of all raw/semifinished are necessary. This would be done from a protectionist point of view, justified only by the current emergency and possibly in the charge of a specific EU Commission, then apportioning the raw material because of various factors including the production potential of the individual member country. It could have, for obvious reasons related to its nature as a pre-eminent country in the tanning industry, precisely Italy a leading role in this hypothetical commission.

In addition to measures of an economic self-protective nature, it will be increasingly necessary to implement the best results of a dedicated and multidisciplinary scientific research, always coordinated at the level of the European Community in order to mitigate the main criticalities of the tanning industry such as:

- The consumption of process water by providing for ever increasing purification and internal recycling processes, as well as, of

course, defining new tanning processes that inherently require less and less water;

- The intensification of the search for tanning methods that are increasingly chrome free or even metal free, but without resorting to (too many) auxiliary chemicals to preserve the performance of the leather. This with the aim of both reducing the consumption of nonrenewable resources, in the specific case the chromium, which can be diverted in an increasingly important way to the metallurgical industry, which absorbs it in large quantities for the production of strategic materials such as chromium alloys and of stainless steels, a market that is also suffering due to Russian aggression against Ukraine [Anonymous (2021)].

In addition, of course, to the reduction or, ideally, the eradication of all the environmental problems inherent in chromium and, in particular, that of its accidental conversion to hexavalent chromium, it will be necessary to "amend," so to speak, the tanning processes of all those chemicals that constitute an obstacle (as well as a cost) to depuration/biodegradation. They go by quality and quantity to alter the original intrinsically biological and circular nature of the tanning process, which, it must be reiterated, represents an extraordinary way-perhaps the oldest and most ingenious of examples of applying circular economy principles to a waste-to bring enormous added value to a by-product otherwise destined to be a huge environmental problem.

Faced with such a disturbing scenario, there is a clear need to adopt countermeasures projected over the medium and long term, providing, with renewed impetus, adequate investment, and increasingly implementing the principles of the circular economy and technological innovation to the leather industry, but in the same time aiming at the European level to increasingly implement environmental labeling and traceability of raw or semi-finished hides as well as finished leather and chemicals, to counter more and more foreign productions that are disrespectful of environmental, labor welfare, and finished product safety issues.

The market for materials proposed as alternatives to leather, whether exclusively synthetic ones such as polymers derived from petrochemicals, or those of synthetic biogenic origin such as Appleskin, Desserto (essentially cellulosic pulps from various plant sources, including waste), more or less additivated in some cases with prevailing shares of synthetic components (PVC and PU), is also growing as an effect of ecovegan propaganda that is not infrequently as uninformed as it is aggressive. It must, in fact, be remembered that no animal is killed to obtain its skin for tanning purposes (apart from the case of the fur

industry). It is no coincidence that the 2021 UNIC sustainability report includes the proposed use of the ethical claim "we recover our hides and skins from the food chain," which, in an extremely succinct and effective way, summarizes the origin of a material that is natural, biodegradable, and able to meet the requirements of the circular economy.

Moreover, many claims in support of alternative materials, accompanied by often ideologized propaganda, are punctually refuted by scientific studies, as demonstrated recently [Meyer, 2021] by the FILK, Freiberg Research Institute, which compared eight new materials by subjecting them to various tests (standardized physical tests in use for leather such as mechanical performance, water absorption, water vapor permeability etc) used for shoes manufactured from genuine leather uppers and man-made materials, respectively. It emerged from the study that the most significant parameters of functional performance are, even today, for real leather, superior in many respects to synthetic materials, of which none can simultaneously match the physical-mechanical properties of real leather; this is the result of the particular, inimitable three-dimensional interwoven structure of collagen fibers that "have no beginning and no end" and which is appropriately protected by Italian Legislative Decree No. 68/2020, which defines it as a material of animal origin that has *preserved the original intact fibrous structure*.

For this aspect, therefore, technological and scientific research, both public and private, which is already traditionally very active, will be fundamental in order to design a leather already from the earliest stages of the tanning process in an increasingly forward-looking way with a view to the product's end of life and its implementation in other production processes, without for this reason renouncing a tanned leather that meets the needs of modern consumers from both an aesthetic and performance point of view.

Obviously, although the transition from a linear to a circular economy is inevitable in the current

economic context, we must not forget, however, that every process of reuse, recovery and recycling will in turn involve waste production and energy consumption, and therefore, ultimately the tanning industry can only mitigate environmental issues but of course not eliminate them altogether. The extent of this mitigation will be closely linked to the simplification of tanning production processes (fewer chemicals and less impactful) and the efforts made to "design" leather goods that can be at the end of life, as well as by-products, more easily recyclable even before they become waste.

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