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## SUSTAINABLE STRATEGIES AND WAYFORWARD – KAZAKHSTAN LEATHER SECTOR

**Abstract.** This review article discusses the importance of leather as a durable byproduct of livestock production and the sustainability practices in the leather industry. It highlights chemical safety, carbon footprint reduction, renewable materials, and ethical sourcing. The potential for innovation in Kazakhstan's leather industry, the benefits of a circular economy, and the challenges posed by synthetic alternatives are covered. There is tremendous potential to produce value-added products like leather, gelatine, collagen, poultry and fish feed, and organic fertilizers from slaughterhouse wastes and leather industry wastes

**Keywords:** leather industry, circular economy, renewable raw materials, waste management, leather.



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**Introduction.** Leather is an important byproduct of livestock production with a rich history. Its durability and position as a luxury good make it a desirable material across the society. The volume of hides and skins collected as a by-product from the meat industry is significant. The leather industry adds value to these by-products, which otherwise would mostly go to waste, and transforms them into one of the most versatile and attractive materials on earth the leather. Leather is a protective, versatile, durable, breathable material and is the best way of dealing with the high volume of hides and skins that have to be sustainably and affordably managed [1].

**Analysis and discussion.** Sustainability. Sustainability is a paradigm for any business strategy at present. Sustainable economy requires new technologies and priorities. Balancing the earth's resources with consumption and population growth is essential for future survival. Given leather's status as a luxury good and association with quality, consumer pressure for awareness of sustainable practices is higher than for alternatives such as plastic. Renewable raw materials, recycling options and waste reduction will be the key for success. Our responsibility goes beyond developing and selling leathers and products but have to offer holistic technical solutions to the society [2].

Few important dimensions of environmental aspects of sustainability for leather processing:

- Profiling of toxicity and safety of used chemicals to produce the material;
- Product Carbon Footprint (PCF) – resource requirements of the product over its life cycle.;
- Renewable raw materials – base for process chemicals and the origin of used substrates;
- Hide traceability – ensuring of animal welfare and avoidance of deforestation.

Best practices have been established in many factories with low/optimized water consumption and low energy consumption during leather processing.

Brands are not ultimately interested in leather but they just need a high performance substrate to work with and enforce their environmentally clean philosophy. Hence it is our responsibility to be proactive to extract the full potential of collagen containing waste of meat industry using eco-benign chemicals and best processing methodologies.

*Progressive creation and development.* Kazakhstan leather industry can be proactive in creating new trends and finishes with the inherent skills. Periodical training for the technical personnel regarding the demands of the standards and brands is very imminent. Every factory should have a laboratory with trained chemists to analyse the purity of chemicals employed and to avoid process wastages and corrections. Simple chemical-mechanical properties of skins and leathers will result in major quality assurance.

Leather industry needs orchestrated initiatives to project leather as a high valuable product with all stake holders. We need to agree on standards for genuine leather and best available technologies. Leather production itself is an integral part of an excellent recycling concept based on a sustainable material. Courageous innovation could make the process of change to happen [3]. Ofcourse we should broaden our scope and redefine our business scope to the entire collagen business.

As much as possible by-products need to be recycled or used up for durable consumer products or other innovative applications in agriculture, food and cosmetics. It is high time we make the remaining process waste to be insignificant in terms of value, volume and toxicity.

*Responsibility of chemical industry: taking a lead in the process of change.* Many tanneries are small and medium sized companies with limited R & D resources. Their focus lies in quality and manufacturing of leather when the brands will just enforce a technical improvement process. In reality the tanneries are squeezed in between giants during manufacturing chain. Chemicals and their application methodologies are major contributor for sustainability improvements of leather manufacturing.

*Circular economy.* Even though leather is a valuable by-product of the meat industry, the concept of Circular Economy (CE) is pertinent for leather sector's sustainability. It is a business concept that involves the further use of materials in a restorative and regenerative manner, thereby extending the utility and value of the materials. CE minimizes material consumption and reduces waste by generating value of the products. The CE concept resembles a closed-loop value chain in which waste materials are reused for consumption [4].

*Waste to wealth: profitable utilization.* In the existing supply chain of leather manufacturing, considerable waste is generated during the production process such as trimmings, fleshings, shavings, buffing dust, product industry wastes and liquid

tannery effluent. The closed-loop manufacturing system minimizes waste and protects the environment. High amounts of reusable wastes are generated in the leather industry which is possible to recycle and even use them as raw materials for different industries.

Fleshings find use in the manufacture of glue, gelatin, chrome tanning aid, chicken feed supplement, plastics, amino acids, artificial sausage casings, surface-active agents and dog chew. Both fleshings and residual hair might well constitute an important source of protein with interesting uses as biological fertilizers in agriculture or horticulture. Hydrolysed protein, because of its high nitrogen content, has potential applications as animal feed additive. The application of collagen-based formulations, as a nutrient source for plants, showing promising agronomic results. Keratin wastes can be converted into tanning auxiliary, foam stabilizer, cosmetics, animal feed, organic fertilizers and Chicken feed.

Disposal of chrome-shaving dust causes contamination of the soil as well as groundwater and finally, chromium enters the human food chain. Usually, chrome shaving dust is managed by land disposal or incineration although effective re-utilization is greatly desirable, as both the methods of disposal involve economic and environmental losses.

The possibility of transforming recovered materials from chrome wastes into useful proteins seemed to present an interesting challenge, and of economic value as well. High value added industrially reusable bio product whose application fields could include veterinary, medicine and pharmacology were isolated. The practice of utilization of shaving dust as a thermally insulating material, composite insulation boards, and adhesives for footwear industries is also being acclaimed. The protein hydrolysates recovered from chrome shavings can be converted into protein filler, cosmetics, adhesives, films, biodegradable polymers and can be used during rubber processing.

The existing leather manufacturing processes do not consider any optimal waste recovery techniques and policy for CE implementation. In addition, during the production of various types of leather goods and leather footwear, numerous amount of waste like trimmed leather, shaving dust, trimmed lining materials, packaging materials, various types of finishing agents, polymeric materials are generated. The existing linear manufacturing practices are responsible for polluting the environment and leather industry reputation. In the current practices, a large proportion of the total waste generated from tanning process is still sent to landfill with no material or energy recovery. Hence, converting linear to closed loop manufacturing process helps to achieve resource efficiency by minimizing waste throughout the leather supply chains. The closed loop leather processing may be implemented by considering 6R (Reduction, Reuse, Recycling, Recover, Redesign and Remanufacture) policy throughout the leather supply chains.

*Leather vs alternatives.* While there are alternatives to leather products, most are made from non-renewable sources (oil), which are environmentally depleting, while leather is a readily available by-product that would otherwise be wasted.

An important aspect of any business development is studying customers, and general consumer buying habits. Recently, Pangea surveyed OEM (original equipment manufacturers) customers, conducted dealer surveys, interviewed leather consumers, and analysed globally published research. After aggregating statistics of thousands of people in Europe, Asia, and the United States, it is found that consumers love leather. Brands seek to meet emotional, value based, and functional consumer needs. Leather has a unique, trendy, and historic way of meeting these buyer requirements, resulting in a definite attraction [5]. There are

many interesting takeaways from recent studies showing consumers believe leather is premium and desirable. To be clear, our studies confirm that there is plenty of demand for leather, but sadly the demand is filled by deceptive marketing practices.

Synthetic material manufacturers generally want their materials to be seen as premium, promoting a false perception that their material is genuine leather, or as leather-like as possible. This is a core issue for our industry. When we look at companies that produce leather imitations, they typically include the noble name of leather within their brands. Instead of stating the true composition as Polyvinyl Chloride, they claim as vegan leather. Consumers are being misled, either accidentally or purposefully, and our industry has been slow to respond. Europe has done the best job of driving regulation surrounding the use of the leather name, and spin-offs of the term. Legislation in some European countries is supporting the leather description and banning misuse.

To maintain the integrity of leather, an industry we care so deeply about, we must push the true narrative of leather and honesty in materials. We need to accept that synthetics are here to stay based on their cost proposition. However, we do not need to accept synthetic products being called, either directly or implied, 'leather'. It's time for the leather industry to connect with consumers about innovations and genuine leather truthfulness [6].

*Modern leather manufacturing: Is rightly reflected in medias?* False facts and figures created wrong perception that dirty processing is omnipresent. Leather can be made without undue damage to the environment using best available technologies. The image of the leather industry requires reputation.

*Social responsibility: A commitment to future generations.* Leather is an organic material that can last decades, reducing the need for replacements. As a by-product of the meat industry, the demand for meat and dairy consumption is the primary driver behind the supply and availability of hides and skins for leather production, rather than the consumption needs of the leather sector.

In the recent years the industry has instituted a number of initiatives to ensure corporate responsibility throughout the supply chain. Tanners around the world have undertaken extensive work in terms of corporate social responsibility and sound environmental practices.

**Conclusion.** As Kazakhstan has huge livestock population, there is tremendous potential to produce value added products like leather, gelatine, collagen, poultry and fish feed and organic fertilizers from slaughterhouse wastes and leather industry wastes.

There is no better alternative of using discarded hides and skins than to make leather. The presence of large volumes of perishable animal waste would have serious consequences on solid waste systems and place tremendous pressure on the environment.

There are eco-friendly process methodologies are available to produce valuable products without affecting the ecology.

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#### **ТҰРАҚТЫ СТРАТЕГИЯЛАР ЖӘНЕ ДАМУ ПЕРСПЕКТИВАЛАРЫ – ҚАЗАҚСТАНДЫҚ БЫЛҒАРЫ СЕКТОРЫ**

**Аңдатпа.** Бұл шолу мақаласы терінің мал шаруашылығының ұзақ мерзімді жанама өнімі ретіндегі маңыздылығын және тері өнеркәсібіндегі тұрақты даму тәжірибесін қарастырады. Химиялық қауіпсіздікке, көміртегі ізін азайтуға, жаңартылатын материалдарға және жеткізушілерді этикалық таңдауға ерекше назар аударылады. Қазақстанның былғары өнеркәсібіндегі инновациялардың әлеуеті, дөңгелек экономиканың артықшылықтары және синтетикалық баламалармен байланысты проблемалар қарастырылуда. Былғары, желатин, коллаген, құс және балық тағамдары, сондай-ақ мал сою алаңдары мен былғары өнеркәсібінің қалдықтарынан органикалық тыңайтқыштар сияқты қосымша құнды өнімдерді өндіру үшін үлкен әлеует бар.

**Тірек сөздер:** былғары өнеркәсібі, дөңгелек экономика, жаңартылатын шикізат, қалдықтарды басқару, былғары.

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#### **УСТОЙЧИВЫЕ СТРАТЕГИИ И ПЕРСПЕКТИВЫ РАЗВИТИЯ – КАЗАХСТАНСКИЙ КОЖЕВЕННЫЙ СЕКТОР**

**Аннотация.** В данной обзорной статье рассматривается важность кожи как долговечного побочного продукта животноводства и практика устойчивого развития в кожевенной промышленности. Особое внимание уделяется химической безопасности, сокращению углеродного следа, возобновляемым материалам и этичному подбору поставщиков. Рассматривается потенциал инноваций в кожевенной промышленности Казахстана, преимущества циркулярной экономики и проблемы, связанные с синтетическими альтернативами. Существует огромный потенциал для производства продуктов с добавленной стоимостью, таких как кожа, желатин, коллаген, корма для птицы и рыбы, а также органических удобрений из отходов скотобоен и кожевенной промышленности.

**Ключевые слова:** кожевенная промышленность, циркулярная экономика, возобновляемое сырье, управление отходами, кожа.