

THE

Journal

OF THE AMERICAN
LEATHER CHEMISTS ASSOCIATION

June 2024

Vol. CXIX, No.6

JALCA 119(6), 245-292, 2024



119th Annual Convention

TO BE
ANNOUNCED

For more information go to:
[leatherchemists.org/
annual_convention.asp](http://leatherchemists.org/annual_convention.asp)

Contents

Sky Fruit Seed Crush (SFSC): A Potential Source of less Salt Curing of Raw Goatskin

by Md. Abdur Razzaq, M. Mahfujur Rahman, Md. Motinur Rahman and Md. Salamat Ullah 247

Lightweight Detection Model for Animal Wet-Blue Hide Surface Defects Based on Yolov5s

by Qixin Han, Yushan Wan, Luwen Cao, Rong Luo, Yafei Sun and Weikuan Jia 255

Enhancement of Mechanical and Thermal Insulation Properties of Polyvinyl Chloride Foam Using Leather Shavings

by Chao Lei, Weixing Xu, Bi Shi and Yunhang Zeng 268

Expanding the Practical Approach for Salt-Free Tanning: A Chrome-free System

by M. Sathish, Surojit Manna and Nakkala Gopi Krishna 279

Lifelines 291

Distributed by



An imprint of the University of Cincinnati Press

ISSN: 0002-9726

Communications for Journal Publication

Manuscripts, Technical Notes and Trade News Releases should contact:

MR. STEVEN D. LANGE, Journal Editor, c/o University of Cincinnati, 5997 Center Hill Ave., Bldg. C, Cincinnati, OH 45224, USA

E-mail: jalcaeditor@gmail.com

Mobile phone: (814) 414-5689

Contributors should consult the Journal Publication Policy at:
http://www.leatherchemists.org/journal_publication_policy.asp

**REAL
LEATHER.
STAY
DIFFERENT.**

LEATHER BY NUMBERS:

FACTS AND FIGURES FROM THE US LEATHER INDUSTRY AND BEYOND

Note: All figures as of January 2021 or latest available.

ZERO cattle are killed to make US leather. US hides have been valued at **JUST 1-2%** of a cow's total value for the last two years, which is why they are considered a by-product and often end up as waste. The average price per head of US cattle is \$2,000-2.200, while hides vary in price from **\$5 TO \$35 PER PIECE**, if sold at all. ⁽¹⁾

330M hides come from the meat and dairy industries around the world. Approximately **34M** were processed the US. ⁽²⁾ **AS MANY AS 2.4M US HIDES** ended up as landfill in 2019, this is **7%** of the national total.

Worldwide the waste figure is approximately **40%** or **132M** hides. With the average hide weighing 25Kg this means that **3M TONNES** are thrown away ever year.

Leather production turns more than **4.5M TONNES OF** potential waste, every year, into usable, durable goods. This saves **2.7M TONS OF GREENHOUSE GAS EMISSIONS** from landfill sites. ⁽³⁾

Production, processing and distribution of hides and leather products directly employs an estimated **5,486** individuals, who collectively earn more than **\$384M**. US exports of hides and leather was over **\$1.5BILLION** in 2021. ⁽⁴⁾

The US exports approximately **95%** of all cattle hide and wet blue leather products it produces, worth **\$2.85BILLION**. ⁽⁵⁾

Around **45%** of global leather production is used to make footwear, **22%** for clothing, bags and accessories, **18%** for car upholstery, and about **15%** for furniture. ⁽⁶⁾

Water consumption for the production of leather from cattle hides has fallen by more than **35%** in the past 25 years, down from **60 CUBIC-METERS** per ton of hides to **38 CUBIC-METERS** per ton. US tanneries are required, by law, to connect to effluent treatment plants to prevent pollution. ⁽⁷⁾

Leather will biodegrade in **LESS THAN 50 YEARS**. In contrast, it can take **500 YEARS** or more for synthetics, made from petrochemicals, to degrade. ⁽⁸⁾

ReFed's conversion rate for food waste is for **EACH METRIC TON OF WASTE DISPOSAL** there is **9.8 7MT** of **CO2 EQUIVALENT** emitted. In this case, mostly as methane. ⁽⁹⁾

This factsheet is produced by the Leather and Hide Council of America (L&HCA), established to promote the US leather industry which is responsible for a significant proportion of the international trade in hides. The L&HCA works to establish best practice in US leather production and to share this worldwide. Figures quoted refer to the USA unless otherwise stated.

SOURCE:

- (1) <https://downloads.usda.library.cornell.edu/usda-esmis/files/rx913p88g/w0893g25p/5d86qb66f/1stk0223.pdf>
- (2) <https://downloads.usda.library.cornell.edu/usda-esmis/files/r207tp32d/pg15cj85z/hd76t466z/lsan0422.pdf>
- (3) 2020 LHCA Infographic
- (4) John Dunham & Associates, Economic Impact of the Meat Industry (2016)
- (5) <https://thesustainabilityalliance.us/wp-content/uploads/2020/04/US-Hide-Skin-and-Leather-Factsheet-0420.pdf>
- (6) TBC
- (7) 2020 LHCA factsheet
- (8) <https://en.wikipedia.org/wiki/Leather#:~:text=Leather%20biodegrades%20slowly%20E2%80%94taking%2025,or%20more%20years%20to%20decompose>
- (9) <https://insights-engine.refed.org/impact-calculator?inputs=%207B%22sector%22%3A%22manufacturing%22%2C%22type%22%3A%22fresh-meat-seafood%22%2C%22unit%22%3A%22tons%22%2C%22alternative%22%3Afalse%2C%22destinations%22%3A%20%20%22key%22%3A%22refuse-discards%22%2C%22current%22%3A1%7D%5D%7D>

JOURNAL OF THE AMERICAN LEATHER CHEMISTS ASSOCIATION

*Proceedings, Reports, Notices, and News
of the*
AMERICAN LEATHER CHEMISTS ASSOCIATION

OFFICERS

JOSEPH HOEFLER, *President*
3213 Rockhill Rd.
Perkiomenville, PA 18074

John Rodden, *Vice-President*
Union Specialties, Inc.
3 Malcolm Hoyt Dr.
Newburyport, MA 01950

COUNCILORS

Goetz Hagen
Tannin Corporation
65 Walnut Street
Peabody, MA 01960

LeRoy Lehman
TFL USA/Canada Inc.
636 Fisher Field Rd.
Blairsville, GA 30512

Todd Salzman
Hermann Oak Leather Co.
4050 North First Street
St. Louis, MO 63147

Myron Hooks
The Dow Chemical Company
400 Arcola Rd.
Collegeville, PA 19426

Roger A. Pinto
Pangea Made, Inc.
2920 Waterview Dr.
Rochester Hills, MI 48309

Marcelo Fraga de Sousa
Buckman North America
1256 N. McLean Blvd.
Memphis, TN 38108

EDITORIAL BOARD

Dr. Meral Birbir
Biology Department
Faculty of Arts and Sciences
Marmara University
Istanbul, Turkey

Chris Black
Consultant
St. Joseph, Missouri

Dr. Eleanor M. Brown
Eastern Regional
Research Center
U.S. Department of Agriculture
Wyndmoor, Pennsylvania

Cietta Fambrough
Leather Research Laboratory
University of Cincinnati
Cincinnati, Ohio

Mainul Haque
ALCA Education
Committee Chairman
Rochester Hills, Michigan

Joseph Hoefler
Consultant
Collegeville, Pennsylvania

Elton Hurlow
Retired
Memphis, Tennessee

Prasad V. Inaganti
Wickett and Craig of America
Curlwensville, Pennsylvania

Dr. Song Jiang
Principal Biomedical Scientist
Huzhou Institute of Biological
Products Co., Ltd.
Zhejiang, China

Dr. Tariq M. Khan
Research Fellow, Machine Learning
Faculty of Sci Eng & Built Env
School of Info Technology
Geelong Waurm Ponds Campus
Victoria, Australia

Nick Latona
Eastern Regional Research Center
U.S. Department of Agriculture
Wyndmoor, Pennsylvania

Dr. Xue-pin Liao
National Engineering Centre for Clean
Technology of Leather Manufacture
Sichuan University
Chengdu, China

Dr. Cheng-Kung Liu
Research Leader (Ret.)
Eastern Regional Research Center
U.S. Department of Agriculture
Wyndmoor, Pennsylvania

Dr. Rafea Naffa
Innovation Services, CS&I
Fonterra Research and
Development Centre
Palmerston North, New Zealand

Edwin Nungesser
Dow Chemical Company
Collegeville, Pennsylvania

Dr. Benson Ongarora
Department of Chemistry
Dedan Kimathi University of Technology
Nyeri, Kenya

Lucas Paddock
Chemtan Company, Inc.
Exeter, New Hampshire

Roger A. Pinto
Director of Sustainability & Innovation
Product Development
Pangea
Rochester Hills, Michigan

Dr. J. Raghava Rao
Central Leather
Research Institute
Chennai, India

Andreas W. Rhein
Tyson Foods, Inc.
Dakota Dunes, South Dakota

Dr. Majher Sarker
Eastern Regional
Research Center
U.S. Department of Agriculture
Wyndmoor, Pennsylvania

Dr. Bi Shi
National Engineering Laboratory
Sichuan University
Chengdu, China

Dr. Palanisamy Thanikaivelan
Central Leather
Research Institute
Chennai, India

Dr. Xiang Zhang
Genomics, Epigenomics and
Sequencing Core
University of Cincinnati
Cincinnati, Ohio

Dr. Luis A. Zugno
Buckman International
Memphis, Tennessee

PAST PRESIDENTS

G. A. KERR, W. H. TEAS, H. C. REED, J. H. YOCUM, F. H. SMALL, H. T. WILSON, J. H. RUSSELL, F. P. VEITCH, W. K. ALSOP, L. E. LEVI, C. R. OBERFELL, R. W. GRIFFITH, C. C. SMOOT, III, J. S. ROGERS, LLOYD BALDERSON, J. A. WILSON, R. W. FREY, G. D. MCLAUGHLIN, FRED O'FLAHERTY, A. C. ORTHMANN, H. B. MERRILL, V. J. MLEJNEK, J. H. HIGHBERGER, DEAN WILLIAMS, T. F. OBERLANDER, A. H. WINHEIM, R. M. KOPPENHOEFER, H. G. TURLEY, E. S. FLINN, E. B. THORSTENSEN, M. MAESER, R. G. HENRICH, R. STUBBINGS, D. MEO, JR., R. M. LOLLAR, B. A. GROTA, M. H. BATTLES, J. NAGHSKI, T. C. THORSTENSEN, J. J. TANCIOUS, W. E. DOOLEY, J. M. CONSTANTIN, L. K. BARBER, J. J. TANCIOUS, W. C. PRENTISS, S. H. FEAIRHELLER, M. SIEGLER, F. H. RUTLAND, D.G. BAILEY, R. A. LAUNDER, B. D. MILLER, G. W. HANSON, D. G. MORRISON, R. F. WHITE, E. L. HURLOW, M. M. TAYLOR, J. F. LEVY, D. T. DIDATO, R. HAMMOND, D. G. MORRISON, W. N. MULLINIX, D. C. SHELLY, W. N. MARMER, S. S. YANEK, D. LEBLANC, C.G. KEYSER, A.W. RHEIN, S. GILBERG, S. LANGE, S. DRAYNA, D. PETERS, M. BLEY

THE JOURNAL OF THE AMERICAN LEATHER CHEMISTS ASSOCIATION (USPS #019-334) is published monthly by The American Leather Chemists Association, c/o University of Cincinnati, 5997 Center Hill Ave., Bldg. C, Cincinnati, Ohio 45224. Telephone (513) 290-2505. Single copy price: \$10.00 members, \$20.00 non-member plus shipping and handling. Subscriptions: \$185 for hard copy plus postage and handling of \$60 for domestic subscribers and \$70 for foreign subscribers; \$220 for ezine only; and \$240 for hard copy and ezine plus postage and handling of \$60 for domestic subscribers and \$70 for foreign subscribers.

Periodical Postage paid at Cincinnati, Ohio and additional mailing offices. Postmaster send change of addresses to The American Leather Chemists Association, c/o University of Cincinnati, 5997 Center Hill Ave., Bldg. C, Cincinnati, Ohio 45224.

ALL THE QUALITY YOU NEED MADE EASY

Member of
italtannery.com

The new
standard
is here



RELIABILITY | CONTROL | HIGH TECHNOLOGY | SUSTAINABILITY



MILLING DRUMS



SPRAY BOOTHS



TUNNEL DRYERS



AUTOMATION



more



GreenTan[®]

**Eco-friendly
leather tanning
system for our
greener future.**



GREENTAN

GreenTan[®] C

GreenTan[®] M-5

GreenTan[®] N-90

GreenTan[®] T-22M



Tel: (603) 772-3741 • www.CHEMTAN.com



Excellent – Bisphenol optimized syntans to achieve high leather quality



Through dedicated research we have developed a core range of bisphenol optimized syntans. The first, TANIGAN® MBO Liq, TANIGAN® OSO Liq and TANIGAN® FAO Liq, have already been launched. These TFL pioneering syntans address the latest regulatory challenges ahead of time with a BPS content below detection limit and are completely free of BPF. These remain an essential part of Wet-end processing ensuring the required leather tightness, fullness, softness and fastness attained. They also consume less energy in their production and have a lower carbon dioxide footprint. You can expect further product launches adding onto these essential “building blocks” shortly.

TFL – Great chemicals. Excellent advice.

» www.tfl.com

Chemtan waterproof technology - inspired by nature



 **CHEMTAN**

Tel: (603) 772-3741
www.CHEMTAN.com