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## DAIRY FOODS DIVISION SYMPOSIUM: ADVANCES IN SUSTAINABILITY WITHIN THE DAIRY PROCESSING INDUSTRY

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**0569 New packaging and strategies to enhance your sustainability plan.** E. Comere\*, *Tetra Pak Inc., Denton, TX.*

Tetra Pak is the world's leading food processing and packaging solutions company. Working closely with our customers and suppliers, we provide safe, innovative, and environmentally sound products that each day meet the needs of hundreds of millions of people in more than 170 countries around the world. With more than 23,000 employees based in over 80 countries, we believe in responsible industry leadership and a sustainable approach to business. Technical development in the packaging industry is intense today, and everyone is trying to crack the code of sustainable packaging introducing new base materials (e.g., renewable, plant based, biodegradable, etc.), processes, and strategies. Driving innovations that address environmental impacts and designing products with the environment in mind will deliver a new competitive edge that can't be ignored. We have already seen multiple innovations in packaging over the last few years. After light weighting and recycling, the next stage of evolution and innovation is around raw material selection, with companies acknowledging our natural resource challenges and rethinking what their packaging is made of. At the same time, new packages have to meet stakeholder demands and offer good convenience while winning environmental arguments in an increasingly competitive business environment and circular economy context. It also highlights how predominant the role of packaging is in the food and drink supply chains (beyond ensuring food contents are delivered safely to consumers, it helps reduce food waste). This session will focus on packaging trends and new sustainable material options, sustainable sourcing, i.e., expanding focus from the end of life of the package (reuse/recycling) to the beginning of a package's life cycle and increasing use of renewable materials responsibly sourced, and understanding the nature of consumer knowledge (including gaps) surrounding sustainable packaging practices.

**Key Words:** sustainable, environment, renewable  
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**0570 Life cycle environmental assessment of yogurt production and consumption in the USA.**

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The innovation Center for U.S. Dairy commissioned and jointly conducted a life cycle assessment (LCA) of the yogurt

supply chain focused on defining potential environmental impacts with the University of Arkansas. The system boundaries for this study include milk production, yogurt processing, filling and packaging, retail, and finally consumption of the yogurt including disposal of the packaging material. Estimated impacts in various unit processes (milk production, processing, packaging, transport, retail, and consumption) including product losses at each stage are reported and discussed. The functional unit is 1 kg of yogurt products consumed by U.S. consumer as sold at retail, for the year 2013. LCA data were analyzed using stochastic methods (Monte Carlo simulation) to quantify and characterize uncertainty. The impact categories used in the evaluation include climate change, photochemical oxidant formation, cumulative energy demand, freshwater eutrophication, freshwater depletion, water eutrophication, human toxicity, and marine eutrophication, ecosystems, and ecotoxicity. Here, the environmental profile is defined as the comprehensive set of inventory and impact assessment results. The report also provides interpretation and evaluation of the results to help identify the potential risks and opportunities in the yogurt production value chain. The overall cradle-to-grave GHG emissions for set, stirred, and nontraditional Greek yogurt as sold at retail were found to be 6.03, 4.98, and 7.65 kg CO<sub>2</sub>e per kg of yogurt consumed, respectively. Using a simulated traditional Greek yogurt plant for production LCI, the cradle-to-grave greenhouse gas emissions were estimated to be 8.92 kg CO<sub>2</sub>e per kilogram consumed. In the cradle-to-grave assessment, production of milk is the dominant contributor to most environmental impacts, and thus ongoing industry efforts to improve milk production will lead to improvements in the yogurt manufacturing sector as well. In the farm-gate-to-retail-gate analysis, yogurt transport was the single largest GHG emission contributor followed by ingredients, electricity, and packaging materials. The results suggest that careful optimization of the transport distances and the selection of transport refrigeration system using low-GWP refrigerants could reduce environmental impacts.

**Key Words:** yogurt, LCA, environmental impact  
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**0571 Using big data to drive sustainable CIP.** J. Curran\*,  
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The promise of big data as a means to drive process consistency and conformity is alluring to many industries; however, the execution often falls short of the desired outcome due to a lack of analytical resources or an inability to capture the key metrics that help drive decisions. In food and beverage processing, much of this data is already captured using existing plant instrumentation. Further, the trend has been toward recording this information electronically to allow for more data points and faster analysis; however, this data is rarely used to its fullest potential. It is stored as required, and