

Agricultural plastics - considerations for milk production and dairy packaging

Introduction

Plastics are used extensively across all agricultural sectors, including in dairy production and packaging (as is the case for nearly all sectors of the global economy). According to the FAO's 2021 *Assessment of Agricultural Plastics and their Sustainability: a Call to Action*¹, plastics' use in agriculture "can increase productivity and efficiency in all agricultural sectors and help minimize food loss and waste..."

Nevertheless, U.S. dairy is dedicating significant focus to responsible management of plastic waste and share the FAO's goal of "dealing with the issue of agricultural plastics holistically within the context of food security, nutrition, food safety, biodiversity and sustainable agriculture."

In 2023, the Innovation Center for U.S. Dairy's U.S. Stewardship Commitment will pilot a new set of metrics that will allow U.S. dairy processors to measure and report on: company research and/or investment in the use of post-consumer recycled (PCR), post-industrial recycled (PIR) content for primary, and/or secondary product packaging; strategies to reduce or replace non-recyclable and/or non-compostable components; and the types of materials companies are using in product packaging.

Considerations for milk production

For dairy, different kinds of plastics play a key role in animal comfort and care, food safety, and environmental stewardship, among other factors. Plastic use on U.S. Dairy farms may vary, but common uses include animal housing and tracking, milk collection, veterinary care, feed storage, and covering manure to reduce greenhouse gas emissions.² Different plastic applications have different rationales and considerations for use, reuse, recycling, and/or disposal. For example:

Animal care

Durable plastic housing ("hutches") for calves protects against disease and weather and allows for individualized monitoring and feeding, as needed. Hutches can be reused for many years. On the other hand, items like plastic identification tags allow farmers to track, trace, and monitor individual animals' health, nutrition, efficiency and productivity throughout their lives. These tags provide unique identifiers and cannot be reused. Plastics may be used for other animal care and biosecurity needs, including safe packaging and storage for veterinary and hygiene products (soaps, sanitizers, etc.), as well as personal protective equipment for farm workers.

Feed production & storage

Plastic covers and bags are essential to storing and protecting dairy cows' feed (called silage), reducing spoilage and waste, preventing contamination and disease, and preserving nutrients. Silage covers allow feed to be stored closer to animals and all but eliminates the need for conventional silos, which are resource-intensive and increase safety hazards for farm workers. The thin plastic of silage covers and bags generally cannot be recycled, but there are efforts to develop new recycling infrastructure that can handle these materials.

1: FAO. 2021. *Assessment of agricultural plastics and their sustainability. A call for action*. Rome. <https://doi.org/10.4060/cb7856en>

2: Information on common uses in this paper is gathered from industry sources, as well as from the FAO paper in footnote 1.

Milk collection

Many components of a milking machine may be made of plastics, these can include milking tubes, shields, and filters, all of which must meet strict standards for hygiene and quality to ensure food safety.

Environmental stewardship

U.S. dairy has set a goal to achieve greenhouse gas neutrality by 2050, including through innovations such as capturing emissions from manure and turning them into renewable fuel. Plastics covers and liners help capture gasses emitted by manure and prevent soil and water leakage. These covers and liners are made from thick, rubberized plastic material with lifespans of up to 20 years before they need to be replaced.

Considerations for dairy packaging

On the journey from farm to consumer, dairy packaging must maintain quality, shelf life, and safety of the multitude of different dairy products available. Many of the top five dairy products exported globally (nonfat dry milk powder, cheese, whey, lactose, and infant formula³) require specific packaging with few or no sources of recycled or recyclable packaging that can meet the required standards and specifications.

Packaging innovation is an area of priority focus, but developing more recyclable or suitable substitutes, requires significant time and may necessitate regulatory changes. Non-plastic alternatives may not meet food safety and functional requirements or may introduce other trade-offs. For example, metal and glass packaging are both more expensive than plastic and heavier, adding environmental impacts in transportation. Paper packaging cannot serve the same food safety and functional purposes as plastic. In fact, paper packaging for dairy products is predominantly polymer coated, which makes recycling of the packaging more difficult.

U.S. dairy processors are working with suppliers to increase the use and availability of post-consumer recycled content (PCR) for packaging, but maintaining an adequate commercial supply of such material will continue to present challenges. Use of PCR also requires consideration of the unique product safety and quality standards for dairy foods. The U.S. Food and Drug Administration (FDA) conducts robust evaluations of recycling processes for plastic materials used in food packaging and other food-contact applications.⁴ Similar to virgin material, recycled plastics used in food-contact applications must be suitably pure for their intended use.



Conclusion

Like nearly every other sector of the global economy, plastics are widely used in agriculture because they provide a wide range of benefits to producers, the plants and animals they care for, and consumers around the world.

Plastics tools and equipment used on dairy farms has enhanced animal comfort and care, made the farm environment safer for workers and animals, increased efficiency, and provided important tools for reducing environmental impact. Plastic packaging plays a critical role in delivering safe, hygienic, and high-quality dairy for healthy diets, and is instrumental in reducing in reducing food waste and spoilage.

These factors must be taken into consideration as countries, international organizations, and the private sector work together to develop holistic approaches to keeping plastic in the economy and out of the environment.

3: <https://www.fas.usda.gov/dairy-2021-export-highlights>

4: <https://www.fda.gov/food/packaging-food-contact-substances-fcs/recycled-plastics-food-packaging>