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The Green Liner File

Promoting healthy dairy products and practices.

Greetings from Lauren AgriSystems

by Chuck Laney, President

There are four important features that contribute to a well-designed liner.

They include: *liner properties, material selection, dairy impact and cow performance.*

At Lauren, we concentrate on developing liners based on these four features and recommend that you choose your liner in the same way.

A liner's performance is impacted by the system (basement parlor, high line or tie stall) installed at your dairy. Therefore, it's important to know if your system can be set to the design requirements and properties of a specific liner. The most important physical property of a liner is the Touch Point Pressure Differential (TPPD), the vacuum required to close the liner. A higher TPPD will require a higher system vacuum. Other important properties include

liner vents, recommended milkings, and liner compatibility with cleaning trays and jettors, shells and claws.

Material selection is also important as each available material has its pros and cons.

Organic liners tend to resist general wear, but have poor chemical resistance and usually degrade in the wash cycle. Silicone liners have better chemical resistance, clean better and hold their physical properties longer than organic liners.

A liner has an underestimated impact on a dairy's costs. Liner slips and squawks can require additional labor, extend milking times and affect cow health. Plus, costly break-in periods or constant liner changes can affect how cows milk.

Cow performance is significant when selecting a liner because a liner can affect teat-end and udder health within 2-3 weeks. Multi-sided liners out-perform round liners because of how they close and how force is applied to a teat. Teat tissue can be affected by how a liner massages a teat (C and D phase) and cause changes in peak flow and let down.

Read on to learn more about how Lauren AgriSystems has invested in materials, design and systems to milk cows comfortably.

Sincerely,

Lauren's Tri-Circle® Liner: Up Close and Detailed

by Rich Carpenter

As we take a closer look at the Lauren Liner, there are often questions posed about the liner's uniqueness. Some include:

- **Why is it made from silicone material?**
- **What is the purpose of the three ribs?**
- **Why is the liner green?**
- **How does this liner improve teat-ends?**

To answer these questions, we begin with industry problems uncovered during the initial R&D phase of product development that led us to challenge the status-quo. Almost immediately apparent was the need to choose a different material from that of conventional liners. This is because those products were typically made of organic materials which had serious limitations. Some of those included quick wear-out or short lifespan of the product, poor chemical and heat resistance during cleansing and exposure to butter fats and continued degradation of the rubber throughout the lifespan of the material. (see Fig. A below) Importantly, that degradation also provided cracks and crevices for the promotion of bacterial growth and contamination. In response to these extensive studies, Lauren AgriSystems realized the need for a different material if it was to design a superior liner with unmatched performance.

Consequently, silicone was chosen. Not only did this material exceed the physical properties necessary to produce such a liner, it also met FDA standards in material

testing for 3-A approval. The green color was chosen so that customers could readily differentiate our products by sight and to become consistent with our company brand and logo.

The three ribs apparent in our patent pending Tri-Circle® liner really distinguishes the product's performance among all others. This unique design is round in the open position to fit the cow's teat, but collapses as a triangle allowing more surface contact area with teat ends. This provides greater distribution of pressure which virtually eliminates blood pooling in the teat-end. As a result, the liner promotes circulation to teat ends, reduces the "pinching effect" and ultimately results in healthier teat ends. Finally, the Tri-Circle® design improves teat-end health because it milks out faster than other liners reducing overall time spent on milking machines and closure repetitions to teats.

There are also two other distinct features of the Lauren Liner:

- **Higher touch points**
- **Higher system vacuums**

Vacuum settings vary and are assigned to liners based upon each liner's particular design. The amount of vacuum required to make the liner collapse and touch the walls on the opposing sides is unique to every



design. The Lauren Liner requires a higher vacuum because of the Tri-Circle® design and therefore is considered a high touch point liner. Following recommended vacuum settings is very important for optimal performance not only to the Lauren Liner but to all liners. Be sure your settings match the liner you are using. If you are not sure, contact your local dealer equipment servicemen or a Lauren AgriSystems dealer to find out. Additionally, your pulsation settings are just as critical. Be sure to read our next "Green Liner File" where we will take a closer look at proper pulsation settings.

Show updates and future schedule

2006 World Dairy Expo Review

Lauren AgriSystems attended the World Expo this past October in Madison, WI. Among 65,000 visitors and 675 exhibiting companies, Lauren team members spent the week promoting the Tri-Circle® Liner to dairymen from all over the U.S. and world. It was exciting to see the word spread about the Tri-Circle's outstanding benefits. Thanks for everyone that visited and for making it a great show!

Coming up in 2007

Keystone Farm Show

Jan 9-11, York, PA
Booths E278 & E279 in Building #3
www.keystonefarmshow.com

Hoof Trimmers Association,

Jan 25-27, Tampa, FL
Embassy Suites USF/Busch Gardens
Conference Room
www.hooftrimmers.org

World Ag Expo

Feb 13-15, Tulare, CA
Dairy Center Booths 6109 & 6110
www.farmshow.org



Fig. A Side-by-side comparison results between Lauren Liners and Typical Black Organic Liners.

New Heights Dairy

Rice, Minnesota – 850 Cows
Double 16 Herringbone

The installation of Lauren Liners in October 2006 at the New Heights Dairy has delivered some great results for the owners, Brent Czech and his father Myron. This father and son team purchased the dairy in May 2006, and it is serviced and supplied by Stearns Vet Outlet Store in Melrose, Minn.

Brent decided to install Lauren Liners because he had exhausted all management options yet still had a SCC variation day to day of 16,000. At the time, he was also considering putting in alignment arms to help with liner slips and kick offs. When Lauren Liners were installed, his SCC day to day variation tightened up to 14,000, and since then liner slips have been virtually eliminated. For the time being, Brent has decided not to purchase the alignment arms.



Pictured in photo: New Heights Dairy (L) and owner, Brent Czech(R)

New Heights Dairy is now averaging 18 in the hospital pen, down from 40. Somatic cell count (SCC) has also declined, from 260,000 to 225,000.

New Height's teat-end health has also improved. When Lauren Liners were installed, teat-end scores of cows at the dairy revealed that 26 percent scored as 4's, 29 percent scored as 3's, and only 44 percent scored 2's or below. Six weeks later, a second teat-end scoring showed great results: Cows scored as 4's dropped to only 7 percent, cows scored as 3's dropped to 23 percent, cows scored 2's or below went up

to 69 percent.

Brent's philosophy is, "Part of being successful with the Lauren Liner is: Watch the cows, see what they are telling you, and make adjustments accordingly because these liners do make happy cows."

We want to feature your dairy!

We have seen many success stories throughout the dairy industry over the last year and are looking for more. If you have a success story about your dairy, let us share it! Contact us to see how we can shine the spotlight on your dairy.

Call Toll Free - 800.683.0676

When do liners need changed and why?

by Rich LeViere, Field Service



All liners have a life cycle and that cycle length is determined by material selection and design of the liner. The physical breakdown of the liner actually comes from exposure to chemicals in the wash solutions, chemical components within the milk itself, and repetitive cycling. The photos in Figure A illustrate the degradation that has taken place in an organic (black rubber) liner. The first photo in Figure A is a brand new organic liner and the second photo is the same liner after 1000 milkings. The photos are at 1000x magnification. The organic liner, after 1000 milkings, clearly has cracks large enough in which bacteria can grow.

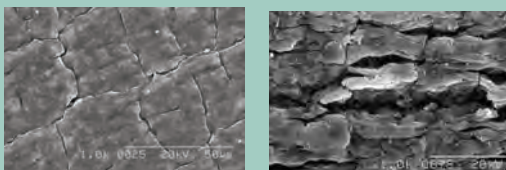


Fig A. Organic Liner - 0 Milkings (L) and 1000 Milkings (R)

The photos in Figure B feature a brand new Lauren Liner and the same liner after 3000 milkings. There is no cracking but physical properties are changing. This liner is manufactured from silicone, which provides the ability to withstand chemical breakdown far longer than a liner made of natural rubber.

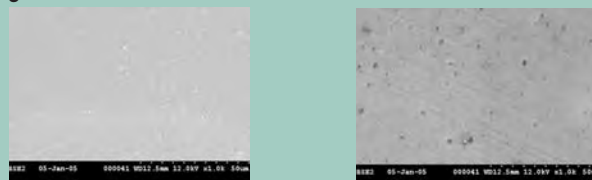


Figure B: Lauren Liner - 0 Milkings (L) and 3000 Milkings (R)

The performance of the liner is affected by the change in the touch point of the liner through its life cycle. Once a liner gains memory from repetitive opening and closing, its touch point drops which changes the way that liner operates at your set vacuum level. Certain liners do change more than others.

Any time you choose to go outside the recommended life of the liner, you jeopardize milk quality and udder health. Changing your liners on time is just one more attention to detail that helps our high performance systems milk today's high performance cows.

Research Update: Butter Oil Absorption Study

by Aaron Kochman

Recently, Lauren AgriSystems completed a butter oil absorption study. Butter oil absorption or migration has always been a topic of interest when it comes to liners, due to the degradation of the liner, which is evident through its lifecycle. There is a visible change, as well as a change in the mechanical properties of the liner as it is used.

Six liners were chosen for the study and 10 samples of each were used. Samples were cut from liner walls and weights were recorded. The butter was heated to 158°F (70°C) and impurities were separated to form butter oil. The samples were immersed in the butter oil and placed in an oven heated to 158°F (70°C) for a period of 24hrs. Samples were then removed and wiped with acetone to remove any butter from the outside of the samples. They were weighed and results were recorded.

Samples were re-immersed and placed in the oven for a period of 15 days (360hrs.). They were then removed and wiped with acetone and weights were recorded.

Figure 1 shows the percentage of change in weights for each of the liners tested. Liners A through E were organic (black rubber) liners and liner F was the Lauren Tri-Circle® Silicone Liner. The results show (see photo) the black rubber liners gaining around 10% on the first day and around 40% by the 15th day. The data also shows the silicone liner with a slight gain at 1.13% the first day and another slight gain to almost 2% by the 15th day.

These results are indicative to the materials the liners are manufactured from. Silicones are commonly known to have better chemical resistance than organic rubber. This should have a direct impact on the life span of a liner and its performance over that time.

Figure 1. Percent weight gains for each sample (n = 10).

Sample	1 day (24hr)	15 days (360hr)
Liner A	9.82%	40.08%
Liner B	11.59%	40.53%
Liner C	17.14%	42.90%
Liner D	10.72%	41.26%
Liner E	13.02%	32.88%
Lauren Tri Circle®	1.13%	1.92%



March Issue:
Pulsation: Importance of correct and consistent settings.

