

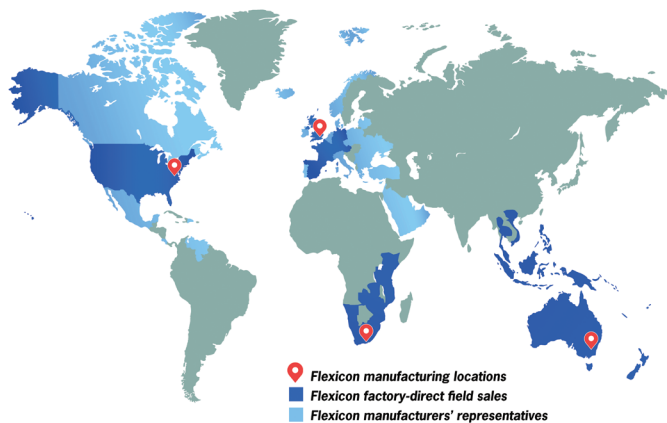
FLEXICON CASE STUDY



The 20 ft (6 m) long flexible screw conveyor transports a mixture of whey powder and colostrum, vitamins and minerals from the ribbon blender to the packaging machine. It has performed reliably for more than 20 years.

Flexible Screw Conveyor Moves Whey Powder for Animal Nutrition Products

Z-0643



flexicon®

USA

FLEXICON CORPORATION
Tel: +1 610 814 2400
E-mail: sales@flexicon.com
Web: www.flexicon.com

UK

FLEXICON (EUROPE) LTD
Tel: +44 1227 374710
E-mail: sales@flexicon.co.uk
Web: www.flexicon.co.uk

AUSTRALIA

FLEXICON CORPORATION
(AUSTRALIA) PTY LTD
Tel: +61 7 3879 4180
E-mail: sales@flexicon.com.au
Web: www.flexicon.com.au

SOUTH AFRICA

FLEXICON AFRICA (PTY) LTD
Tel: +27 41 453 1871
E-mail: sales@flexicon.co.za
Web: www.flexicon.co.za

SPAIN

FLEXICON EUROPE SPAIN
Tel: +34 930 020 509
E-mail: ventas@flexicon.es
Web: www.flexicon.es

FRANCE

FLEXICON EUROPE SAS
Tel: +33 7 61 36 56 12
E-mail: ventes@flexicon.fr
Web: www.flexicon.fr

GERMANY

FLEXICON EUROPE GmbH
Tel: +49 173 900 78 76
E-mail: vertrieb@flexiconeurope.de
Web: www.flexicondeutschland.de

SINGAPORE

FLEXICON SINGAPORE PTE LTD
Tel: +65 6778 9225
E-mail: sales@flexicon.com.sg
Web: www.flexicon.com.sg

INDONESIA

FLEXICON SINGAPORE PTE LTD
Tel: +62 81 1103 2400
E-mail: sales@flexicon.co.id
Web: www.flexicon.co.id

Flexible Screw Conveyor Moves Whey Powder for Animal Nutrition Products

FENNIMORE, WI — Immuno-Dynamics, Inc. is a science-based manufacturer of animal health products providing cattle, calves, lambs and piglets with essential antibodies, proteins, vitamins and minerals during their first hours of life.

The supplements are produced using a valuable milky fluid secreted by dairy cows called “bovine colostrum,” which the company processes and combines with various ingredients to produce end products in the form of tablets, injectable liquids and powders.

To move powdered products containing whey and other ingredients from a blender to a packaging machine, the plant continues to rely on a Flexicon flexible screw conveyor it purchased more than 22 years ago.

Learning from nature

Human and animal newborns cannot acquire antibodies from their mothers' blood while they are in the womb. Instead, they derive this essential protection from the colostrum they suckle during their first few hours of life. Colostrum, also known as “first milk”, contains vital immunoglobulins (antibodies) and cytokines (protein), as well as vitamins and minerals.

Immuno-Dynamics founder Dr. Richard H. Cockrum is a veterinarian who researched colostrum for more than 40 years. He founded the company in 1980 to manufacture colostrum-based products for farmers who hand-feed their calves, lambs and piglets.

From farm to packaged product

One of the company's products is VitaPak, a powdered formulation which promotes health and growth in cattle and pigs. Available in four grades to suit different species and ages of animals, VitaPak is made from dried colostrum, dried whey, vitamins and minerals.

“A cow may produce several gallons of colostrum, of which the calf needs only half a gallon (4 l) or so,” says plant manager Mike Helms, adding, “Farmers collect the surplus within six hours of birth (when its potency is highest), freeze it, and sell it to us.”

At the plant, the frozen colostrum in 2 gal (7.5 l) containers is thawed, tested, concentrated and then spray-dried to yield colostrum powder. The whey powder arrives in 1 ton bulk bags from neighboring dairy plants. Both sweet whey and colostrum are plentiful in Wisconsin, which is the state ranked first in cheese production and second in milk production.



A forklift is used to discharge a bulk bag of whey powder through a sifter and into a ribbon blender, where colostrum, vitamins and minerals are added. The batch is then mixed and gravity discharged into a transfer hopper — a 45-minute process in total.

The powder is gravity fed to the intake of the flexible screw conveyor having an outside diameter of 4.5 in. (115 mm). The powder is then moved 20 ft (6 m) at an incline of approximately 45 degrees by the conveyor to the surge hopper of a packaging machine where it is filled into 25 lb (11.36 kg) polythene-lined cardboard boxes. Packaging a 2 ton batch takes about two hours, Helms says.

Fully enclosed and dust-free, the USDA approved conveyor has crevice-free interior surfaces and a smooth stainless-steel flexible screw that is connected to a drive system above the point at which powder exits the conveyor, precluding product contact with seals. Sanitary operation is critical in the Immuno-Dynamics plant, which has a USDA veterinary biologics license and operates to strict quality standards, Helms explains. The conveyor is easy to clean at the end of each operating campaign, he adds, and is also reliable and easy to maintain.

Two decades of reliable conveying

The Flexicon conveyor was installed in 1989 at the original Immuno-Dynamics plant in Perry, IA plant, and then relocated in 2005 to the company's new facility in Fennimore, WI.

"After operating for more than two decades, the conveyor continues to do the job well and has needed little maintenance," says Helms.

"When I checked our maintenance records, I found that the conveyor had been in service for 22 years," he says. Over that time, maintenance has been limited to a new spiral in 1996, new tube couplings in 2004, and a new outer tube in 2011.

"I'm responsible for the smooth running of the plant, including maintenance operations, and I work in production as well," says Helms. "It means a lot to have a conveyor that not only does the job well but also keeps running for many years with very little attention."

Immuno-Dynamics, Inc.

608-822-4150

www.immunodynamics.com



A bulk bag containing whey powder is discharged into a ribbon blender, where it is mixed with smaller amounts of colostrum, vitamins and minerals. The flexible screw conveyor, fully enclosed, moves the mixture to the packaging machine.



From the blender the mixture enters the intake of the flexible screw conveyor through a transition adapter. Cleanout cap (bottom right) facilitates washdown of the internal spiral.



Powder exits the flexible screw conveyor at the drive end and descends through the downspouting to the packaging machine. The transfer is fully enclosed and dust-free.



Immuno-Dynamics' VitaPak powdered formulation promotes health and growth in cattle and pigs.

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FLEXICON CORPORATION
 Tel: +1 610 814 2400
 E-mail: sales@flexicon.com
 Web: www.flexicon.com