

## Argentine cow clones to produce insulin in milk

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**B**uenos Aires (Reuters) – Argentine scientists said on Tuesday they had created four cloned and genetically modified calves capable of producing human insulin in their milk, a step they said could cut the cost of treating diabetes.

The newborn Jersey heifers – who the scientists have named Patagonia 1, 2, 3 and 4 – will start producing the human hormone when they reach adulthood, said the biotechnology company behind the project, Bio Sidus.

“This model of a genetically modified cow is a model that allows us to produce large quantities of products at very low cost,” said managing director Marcelo Criscuolo, adding that insulin produced by cows would be at least 30-percent cheaper.

“The cattle-ranching know-how we have in Argentina has really given us a startling advantage in generating the technology,” he said at a news conference.

To produce pharmaceutical products from cow’s milk, scientists insert the human gene of interest into an embryo before implanting it into a surrogate mother cow. In this case they used a gene for insulin.

Once milk is obtained from the genetically modified cow, it will be purified and refined to extract the insulin. Similar techniques have already been used to produce human proteins in goats and cows.

Argentina, the world’s third-biggest beef exporter, is famous for its sweeping Pampas

grazing lands and it is one of a handful of countries to have cloned livestock.

Bio Sidus started with a cattle fetus taken from a slaughterhouse, removing selected cells from it and splicing in the human insulin gene.

Then they used cloning techniques to take the genetically modified nuclei from these cells and fuse them into cattle eggs. The cloning process starts the egg dividing as if it had been fertilized and they were able to implant four embryos in four surrogate mother cows.

The Patagonia calves, which were born by Caesarean section in February and March, take their name from the vast region that stretches to the tip of South America. Scientists hope the insulin produced in their milk could be on the market in the next couple of years.

Insulin is used to treat type-1 diabetes and the most severe cases of the more common type-2 diabetes, which is linked to obesity, poor diet and lack of exercise.

Patients with type-1 diabetes normally inject the hormone to control their blood-sugar levels.

There are about 200 million diabetics worldwide, and the Argentine scientists said just 25 insulin-producing cows would be enough for Argentina’s 1.5 million diabetics.

The initial source of insulin in medicine was from cow, horse, pig or fish pancreases, because it is almost the same as human insulin. Most insulin is currently produced by genetically engineered bacteria in tanks. □