

Elite cattle breeds for today's dairy and meat industry



Russian company Betagran Lipezk LLC produces cattle embryos for accelerated herd breeding.

Schelkovo Agrohim JSC holds a leading position on the Russian market in the manufacturing and distribution of plant protection products. The company's focus is on manufacturing pesticides that provide full-coverage protection for the most important agricultural crops, as well as agrochemicals containing micronutrients for controlling the supply of minerals to plants. One of its latest ventures is in dairy cattle breeding, and at the end of 2014, it opened a state-of-the-art facility designed for this purpose: Betagran Lipezk LLC. Where the facility's expertise lies is in producing cattle embryos for accelerated breeding of

dairy and meat herds. Its primary aim is to produce embryos from genetically high-quality breeds of cattle in order to sell them on to breeding-industry companies, creating a core breeding stock and improving the genetic characteristics of herds in the process. Total investment in the project – the only one of its kind in Russia – has amounted to 370 million rubles (more than 6 million US dollars).

Producing embryos involves fertilizing the high-quality oocytes obtained from elite breeds of cattle, then growing them in vitro to the point at which they become mature embryos. These embryos are then cryopreserved, a process that uses low temperatures, and stored until they are applied in embryo transfer

Requirements

- Reproducible growth conditions
- Low risk of contamination
- Optimal growth of cell cultures
- High process reliability

BINDER solutions

- Reliable decontamination concept
- High level of temperature uniformity
- VENTAIR air jacket system
- High relative humidity of up to 95% RH
- Stable pH values thanks to drift-free CO₂/O₂ IR sensor technology



technologies further down the line. The elite embryos can be stored in liquid nitrogen at temperatures of as low as -196°C for an unlimited period of time, as these conditions preserve their vitality.

When it comes to working with embryos, sterile conditions and maximum process reliability are of the utmost importance. This is exactly why Betagran Lipezk LLC made the decision to use CO₂ incubators from BINDER's CB series in order to produce mature embryos. These incubators feature an innovative safety concept: Hot-air sterilization at 180°C is performed regularly, ensuring the unit provides a completely sterile environment for embryo growth. One of the main elements in the unit is a fixed, heat-sterilizable CO₂ sensor. "Working with mammalian cells involves a high risk of external contamination", says biotechnologist Nikolay Chromov, who is responsible for the project at Betagran Lipezk LLC. "We need to operate in line with regulations and record our activities, ensuring that we maintain the strictest standards of sterility in the area in which we are working and in our processes. That is why we opted for BINDER incubators: Thanks to the auto-sterilization with hot air they provide, there is virtually no chance of contamination occurring."

As the cells are highly sensitive to environmental conditions, it is essential that growth conditions are kept constant and reproducible in order to make cultivation as effective as possible. "Cultivating em-



> The hot air sterilization of the CB with separate doors at 180 ° C ensures absolute freedom from germs

bryos requires us to keep all the parameters – such as temperature, humidity, and gas composition – at precise levels. The BINDER units are unsurpassed in their reliability and create entirely constant incubation conditions", says Nikolay Chromov. "Separate doors make it possible to rule out significant changes in the atmosphere within the unit during work with individual plates."

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says Nikolay Chromov

The specialist is thrilled with the way in which the unit parameters are quickly restored: "If a door is opened

or a gas cylinder is changed, the parameters return to their original values extremely quickly – so there is no harmful impact on the cells." Thanks to a BINDER VENTAIR® air jacket system, the temperature is also distributed homogeneously across all levels. Together with the double-pan humidifying system and condensation protection, the air jacket system ensures that the incubator is kept free from condensation. The high level of humidity in the incubator atmosphere effectively prevents nutrients from evaporating. "We are extremely pleased with the BINDER incubators. We are planning to expand the facility in the near future, and would love to add more BINDER incubators in different sizes for use in our in vitro technologies", says Nikolay Chromov.

Vorteile

- Auto-sterilization with hot air at 180 °C
- CO₂ gas-mixing jet with Venturi effect
- Tightly-sealed inner door made of tempered safety glass
- Seamless, deep-drawn inner stainless steel chamber



> CO₂ incubators CB 160

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