

MEDIA RELEASE

Moo-nlight Sonata: UP study finds that cows soothed by classical music produce more milk

A University of Pretoria (UP) study has shown that playing soothing classical music to dairy cows lowers their stress levels and increases their milk production. The findings, which were published in the journal *Domestic Animal Endocrinology*, are the result of research by Lize-Mari Erasmus, a former member of UP's Camerata choir, who has a Master of Science (MSc) degree in Agriculture (Animal Science) cum laude from the University.

Erasmus's MSc studies allowed her to combine her two passions: music and animals. Before embarking on a career in animal sciences, she had obtained a Bachelor of Music degree at UP, with Choral Conducting as one of her majors.

Hers is the first study of its kind in South Africa to investigate the influence of classical music on the stress levels and milk production of cows.

"The health and welfare of dairy cows go hand in hand with efficient and sustainable dairy production," she says about the value of providing farm animals with enriching environments.

The World Organisation for Animal Health (OIE) describes animal welfare as a human responsibility, and includes all aspects of animal life, including proper management, housing, disease prevention and treatment, humane handling and responsible care.

"Providing cows with an enriching, stimulating environment, such as through music, is one way of improving their living conditions and, in the process, looking after their mental needs too," Erasmus says.

In order to oversee the experimental phase of her project, Erasmus spent four months at Innovation Africa @UP's Future Africa Institute, where a herd of Holstein cows are kept.

"Not many studies have been conducted within the setting of a commercial dairy farm such as the one at Future Africa," she notes.

Nine Holstein cows were divided into three groups of three, and over the course of four months, each group was exposed to three treatments. One group of animals was exposed to classical music every day for 24 hours wherever they were on the farm; another group wasn't exposed to any music at all; and in the third group, the cows heard classical music only when they were being milked.

Erasmus says she could sense from their slightly agitated behaviour that the cows that were exposed to music needed time to adapt to their "new normal", which they did within two weeks.

She included works from well-known composers such as Wolfgang Amadeus Mozart, Edvard Grieg, Arcangelo Corelli and Jacques Offenbach, as well as compositions such as Ludwig van Beethoven's *Moonlight Sonata*, Camille Saint-Saëns's *The Carnival of the Animals* and George Frideric Handel's *Water Music*. It was played over a speaker system on shuffle mode to ensure that the animals did not learn to associate a particular sequence of music with a particular part of the day, such as milking time.

About her choice of slower pieces of classical music, Erasmus says: "Previous research has found that dairy cows prefer slow music to fast-paced music, and instrumental music such as the classics rather than rock or Latin music."

In order to determine the stress levels of the cows, and with the help of UP's Endocrine Research Laboratory, she regularly tested how much glucocorticoid (a hormone that is produced in stressful situations) was found in the dung and milk of the animals in the different treatment groups.

"Cows exposed to constant music had the lowest stress-related levels of glucocorticoid in their dung," she explains. "They were noticeably calmer when being milked, which is generally a stressful time of the day because of all the activity."

Up to two litres more milk per milking session were obtained from the cows when they were constantly surrounded by music all day and night.

"The findings indicate that auditory stimuli as a form of environmental enrichment have economic benefits to the producer," Erasmus says. "It could mean that milk producers might be able to keep fewer cows, yet still be profitable. I believe consumers will respond positively if they know that the milk they use comes from cows who are kept on a farm where environmental enrichment of the animals' surroundings is a matter of priority."

Erasmus' research was supervised by Professor Esté van Marle-Köster, Head of the Department of Animal Science at UP, with Prof André Ganswindt, Director of the Mammal Research Institute in UP's Department of Zoology and Entomology, as co-supervisor.

"Prof Van Marle-Köster loves classical music too, and was immediately interested when I first presented her with the idea of studying the influence of classical music as a way of improving the welfare of cows," Erasmus says.

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on the Hatfield Campus, Pretoria. This 115-year-old institution is also the largest producer of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only University in the country with a Faculty of Veterinary Science, ranked top in Africa. Overall has 120 academic departments and 92 centres and institutes, accommodating more than 55 000 students and offering about 1 100 study programmes.

UP is one of the top five universities in South Africa, according to the 2019-2020 rankings by the Centre for World University Rankings. It is ranked among the top 100 universities worldwide in three fields of study (veterinary science, theology, and law) and the top 1% in eight fields of study (agricultural sciences, clinical

medicine, engineering, environment/ecology, immunology, microbiology, plant and animal sciences and social sciences).

In May 2020, the annual UK Financial Times Executive Education Rankings again ranked GIBS as the top South African and African business school. The University also has an extensive community engagement programme with approximately 33 000 students involved in community upliftment. Furthermore, UP is building considerable capacities and strengths for the Fourth Industrial Revolution by preparing students for the world beyond University and offering work-readiness and entrepreneurship training.

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