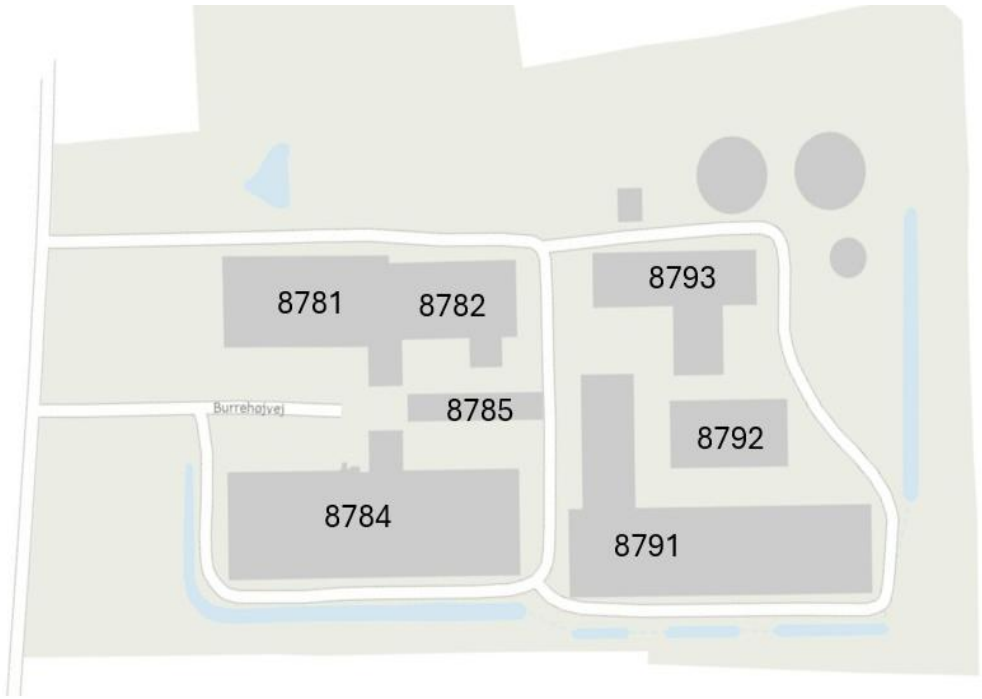
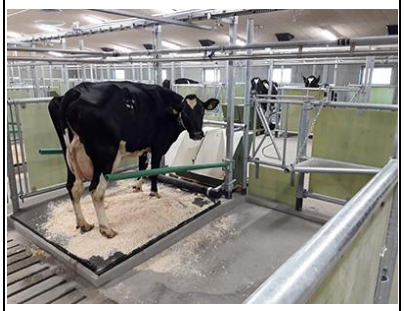
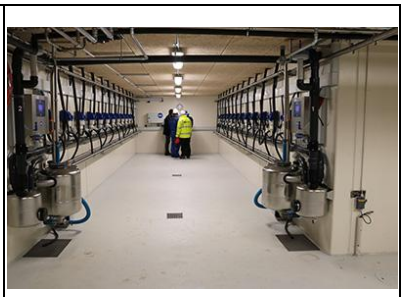
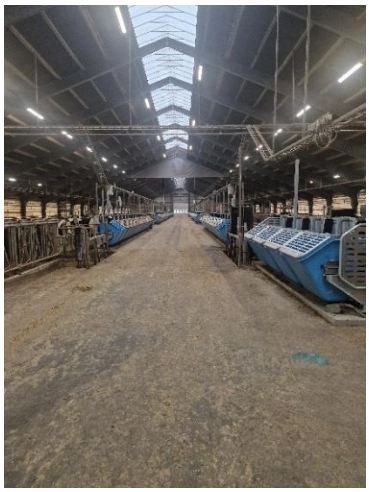
AARHUS
UNIVERSITY
DEPARTMENT OF ANIMAL AND VETERINARY SCIENCES

DKC User Manual	Presentation of DKC
Barn / Building	8781-8793
Period	[25.06.01] – [year.mm.dd]
Responsible	Jens Bech Andersen

Topics	***Description***
General Information about DKC	The **Danish Cattle Research Centre (DKC)** at AU Viborg – Foulum Research Centre – is a high-tech research platform for dairy cattle, housing 260 Holstein dairy cows and young stock. The facility offers state-of-the-art facilities and infrastructure for research involving dairy cows, calves, and heifers. The centre includes two loose housing barns with computer-controlled feeding stations for individual feed intake recording, a milking parlour with a 2x12 SAC side-by-side system, and an intensive barn with 20 individual pens for fistulated cows, as well as four climate chambers for methane emission measurements. The barns for calves and young stock are equipped with deep litter pens and systems for individual feeding, along with a weighing station to monitor growth. In addition, the facility includes a flexible research barn that can be adapted for behavioural studies and alternative housing systems. DKC also manages around 70 hectares of adjacent grazing land, all of which can be irrigated and configured flexibly to suit different experimental designs. Research activities include areas such as nutrition, health, behaviour, reproduction, and animal welfare, with particular emphasis on sustainable milk production, efficient use of energy and nutrients, and the development of solutions that improve both production economics and animal welfare. Methane emissions are measured in climate chambers and using GreenFeed units, which analyse the cows' exhaled air for greenhouse gas output. In connection with the grazing areas, mobile GreenFeed units and additional measuring equipment enable data collection in outdoor studies. Methane emissions are measured both in climate chambers and GreenFeed units, which analyse the cows' exhaled air to quantify greenhouse gas emissions. In connection with the grazing areas, mobile GreenFeed units and supplementary measuring equipment are used to enable data collection in outdoor, pasture-based studies. Additional research includes feed strategies, management systems, and technical solutions. The facility is also used for projects related to barn design, ventilation, and control systems aimed at improving production management in commercial cattle farming. The research centre works closely with external partners and has access to advanced laboratory facilities for the analysis of samples such as feed, blood, urine, and tissue.

Overview of DKC's Facilities	**DKC includes the following barn facilities and grazing areas:** 1. **Intensive Barn** (Building 8793 – Barn 100) 2. **Flexible Barn** (Building 8792 – Barn 200) 3. **Cow Barn and Milking Parlour** (Building 8791 – Barn 300) 4. **Cow Barn** (Building 8784 – Barn 400) 5. **Calf Barn** (Building 8785 – Barn 500) 6. **Young Stock Barn** (Building 8782 – Barn 600) 7. **Feed Barn** (Building 8781 – Barn 700) 8. **Grazing Areas surrounding DKC**  *Figure 1. Aerial view of DKC.*

Descriptions of DKC's Experimental Barns		
1. Intensive Barn (Building 8793 – Barn 100)	The intensive barn is divided into several sections. The main part of the barn contains 20 uniquely designed individual pens, arranged in two separate areas with 8 and 12 pens, respectively. These pens are specially designed to allow rumen- and intestinal-fistulated dairy cows to move freely.	
	Another section of the barn contains four methane chambers, which allow researchers to analyse the cows' exhaled air, including measurements of methane emissions.	
2. Flexible Barn (Building 8792 – Barn 200)	The largest part of the barn is an uninsulated section that can be configured in various ways using a network of floor-mounted anchor points. This section is well suited for behavioural studies, which often require alternative housing layouts. A smaller part of the barn is insulated and can be heated to a minimum of 10°C.	
3. Milking Parlour (Building 8791 – Barn 300)	The milking parlour is equipped with a 2x12 side-by-side SAC system. Milking can be performed in three different modes: all cows at once, one side at a time, or with complete separation of all milk.	

	Beneath the milking parlour is a technical basement, which allows for milk sampling and data collection during milking.	
3 - 4. Cow Barn (Building 8791 – Barn 300)	DKC's dairy cows are housed in two cow barns with capacity for 96 cows (Barn 300) and 140 cows (Barn 400), respectively. Both barns are designed as loose housing systems with cubicles and the possibility of dividing cows into groups ranging from 12 to 70 animals per group.	
	Both barns are equipped with computer-controlled feed stations that collect individual feed intake data for each cow. In Barn 300, there is one feed station per cow, while in Barn 400, one station is shared between every two cows. Barn 300 also allows for measurement of individual water intake. The entire barn is equipped with video surveillance for use in behavioural observations. In addition, individual body weight data can be collected via a scale located in the cow lane leading out of the milking parlour.	
	Barn 300 is equipped to accommodate up to eight GreenFeed units. These units can measure methane emissions from dairy cows while the animals stand in the unit and receive a reward in the form of a small amount of concentrate feed. In addition, there is a concentrate feeder without methane measurement functionality.	

	Barn 400 contains seven individual calving pens equipped with video surveillance and computer-controlled feed stations.	
5. Calf Barn (Building 8785 – Barn 500)	The calf barn includes both individual and group housing in uninsulated sections with deep litter. DKC has several different automatic milk feeders for calves, which allow for data collection during feeding.	
6. Young Stock Barn (Building 8782 – Barn 600)	The young stock barn is an uninsulated loose housing facility containing 15 large, identical deep-litter pens, each of which can accommodate up to 12–14 animals. The barn includes a weighing station where the animals can be weighed, and their growth monitored. Twelve of the pens are equipped with computer-controlled feed stations that collect individual feed intake data.	
7. Feed Barn (Building 8781 – Barn 700)	The feed barn is designed to handle a wide variety of feed mixtures. Rations ranging from 50 kg to 7 tonnes can be mixed on site. Adjacent to the barn is a refrigerated and freezer room used for storing samples, such as feed samples.	

8. Grazing Areas	DKC manages approximately 70 hectares of grazing land located close to the main facility. All areas can be irrigated and divided into paddocks for both small and large groups of animals. The fields can be adapted to different grass and crop types depending on the experimental design. This high degree of flexibility enables a wide range of grazing strategies.	
Custom-Designed Shade Units	Four mobile, custom-designed shade units are available, each covering approximately 60 m² and capable of providing shade for up to 30 cows. They can be freely positioned and used in various studies, such as animal welfare, behaviour, and temperature regulation.	
Mobile Shelters and Measuring Equipment	DKC has five mobile shelters (5.5 × 8 m), which can be equipped with advanced experimental equipment. Four mobile GreenFeed units enable methane emission measurements from up to 24 cows per unit. In addition, water troughs with individual water intake monitoring can be installed. Two of the shelters are equipped with solar panels and battery packs, making them independent of fixed power sources and increasing flexibility in placement and data collection.