Participants:

Poul Pedersen (Skov), Svend Morsing (Skov), Lars Christian Sørensen (SKOV), Anders Riis (SEGES), Kasper Balslev Sørensen (SEGES), Bjarne Bjerg (KU), Pia Brandt (KU), Guoqiang Zhang (AU), Li Rong (AU)

Date and time: 2019.03.12, place: Skejby lab of ENG at AU

Minutes by Li

Guoqiang welcomed all the partners, especially Pia from KU who would start working on the Opcool project from 13th March 2019. Guoqiang also asked if there are any comments on the last minutes and today’s agenda. There are no comments on these two parts.

**Experimental plan**

Bjarne presented comments from different partners concerning to the experimental plan. In order to avoid using the dehumidifier, Poul suggested that the experiments can be conducted during the winter period. Bjarne did the calculations and this plan is applicable.

Bjarne also presented what capacity is needed to use the dehumidifier if the experiments are planned to run during this summer. After consulting Munters, Bjarne suggested that two dehumidifier are needed and each costs 12000 kr. However, it could bring the challenge to coordinate the control system between Skov system and the dehumidifier’s own system. During the discussion, Bjarne also mentioned if we do need to test the case with conditions of 25 oC and 30%. Last, based on the number one rule, that is, to keep the system as simple as possible, it is decided to run the well-planned or real measurements during the winter period and pre-/pilot test during this summer. It means we are not going to use dehumidifier.

To reach the RH of 70%, humidifier have to be used in experiments no matter they are run in winter or summer. Bjarne calculated that 4 kg water per hour is needed to be evaporated. What equipment can be used to evaporate 4 kg water and main the variation of RH a certain level (or accepted level), pointed by Poul? This should be investigated by all the partners and give suggestions at the next project meeting. If we are going to boil 4 kg water per hour to the room, could too much heat be added to the enclosed space and air? Bjarne will calculate the heat released to the room during the boiling process.

Kasper mentioned the fan location in the barn which might be conflict with the air supplying box. It is suggested that Kasper could measure the location of the fan first and if necessary then we move the room fan to another location. Anders mentioned if we are going to change the control system for the room environmental control in the barn. We will keep the system to control the room environment and Skov system will control the four fans associated with the air supplying boxes.

Is the diffuse ceiling area large enough? The answer is enough because most of the time the minimum air flow is needed.

When should we conduct the tests during the gestation period? Last time it suggested to start tests on 50 days, and aovid the 10 days at early pregnant stage. Anders checked that it is not allowed to move the pregnant sows at the last 11 days before the laboring time. Anders also mentioned that SEGES is looking for a new farm for an agreement, which might be in August. SEGES will apply for the permission of using animals for the experiments before August when the pilot test is going to be conducted (this is already mentioned on the first project meeting).

To the last, Svend emphasized that to create the stable air around the pigs are the most important for the tests. To ensure that, pre-test is very important. Two questions are then asked. When are we going to run pilot-test? It was suggested to run the pre-test without animals in Skejby before summer. The pilot test with large fattening pigs will be conducted in August at Grønhøj based on the discussed experimental plan. When are we going to run real test (with animals)? The winter period time after this summer, and they will be run in Grønhøj.

**Skov’s business strategies**

Poul explained the significance of implementing the research results from the project to product development. Normally it takes at least two years to test the product before delivering to the market. Also, it is extremely expensive to have the module to produce the products (e.g. 5 million or something like that☺). It means that Skov need to develop the product for providing proper environment for sows at hot climate in parallel. So Skov has an internal meeting to discuss what products/systems are expected/prioritized to be developed in Opcool project. Ten ideas are presented to the business section at Skov and the LPV-plus systems are the number one.

A few issues mentioned:

* DA1540 vertical with high pressure cooling, the nozzle locations, water vapor injecting angle, ……
* LPV-plus with pre-cooled air
* Assessment of Air conditioning systems applied in boar’s barn including the energy consumption, control system
* Identification of equivalent inlet air speed (mentioned by Svend)
* ……

**Air supplying box**

It is still aware that the even air distribution is a challenge. Skov has some experience in supplying even distributed air in Skov cleaning system. This could be used in the air supplying box. The question is that if the power provided by the fan is big enough. It was decided to run the fan and check the capacity of the fan and to investigate options to achieve the evenly distributed flow.

**Literature review**

Bjarne found a study ‘Sow mortality associated with high ambient temperature’ conducted by Canadian researchers in 1990s. It is further demonstrated the importance of reducing the heat stress of sows in hot climate. Pia will take over the initiative for the literature review of sow’s reactions to hot environment. Bjarne will present the review results at ASABE annual conference.

**Recruitment**

AU is recruiting a PhD candidate to mainly work on the WP2. The positions has been on advertisement for three months and 16 applications were received. Two applicants are suggested to the GSST and we are waiting for the GSST decision.

**Next meeting**

Date and time: 10:00 – 15:00, 4th June; place: Skejby lab; address: 301 Skejby Nordlandsvej, 8200 Aarhus.