7 Summary

What influence does the stage of development of the Dominant Follicle on a bovine ovary have on the capable development of oocytes from belonging subordinate follicles?

In this paper it was checked whether the hormon concentration of a Dominant Follicle would have an influence on the morphology and potential influence on the ability of maturation of oocytes out of submitted follicles. The tests have been executed during a period of 8 months. Altogether 119 pairs of ovaries were tested with 3966 oocytes.
For this purpose it was distinguished between oocytes which are submitted to “no Dominant Follicle”, “estradiol-dominant”, “progesterone-dominant” or which are submitted to an “estradiol- and progesterone-dominant Dominant Follicle”.
The majority of ovaries (71.43%) and the majority of the oocytes (72.62%) were under influence of a “progesterone-dominant Dominant Follicle”.
The morphology of oocytes and the cumulus-oocyte-complexes was checked by layers of cumulus cells, the expansion of cumulus and ooplasm right after generation.
In part one the ability of maturation was proven after 24 hours of maturation by expansion of cumulus, the ooplasm, the build up of a perivitelline space as well as the stage of meiosis.
During the second part of the test the pregnant animals were observed separately under the light of follicular dynamics. Nine cows were tested with altogether 500 oocytes.
The groups are related to the maximum point of growth. The groups “One day before the maximum point of growth“ (minus one/one, minus one/two) and “maximum point of growth” (nil/one, nil/two) both consist of two pair of ovaries. All other groups included in every case only one pairs of ovaries. Since in some categories the representatives have been only on the very low side those test only have been interpreted as single case studies.
In the third part of the study non pregnant cows have been examined under the light of follicular dynamics. The results have been compared with part one. Since also here again in some cases the representatives of two groups have been too small in number the results only could be used for single case studies.

Results:

Most animals tested showed a “progesterone-dominant” and with that in terms of functionality an inactive Dominant Follicle. This was true during the majority in terms of time of the cycle.

Results of experiment I:

1. The test results of “cumulus expansion” clearly showed that the category “slight expansion” was to be observed much more often in the group “no Dominant Follicle” than in any other group.
2. The test perivitelline space demonstrated that number of “questionable oocytes” were extraordinary high in the group “estradiol-dominant”.
3. The test stage of meiosis materialized in a high proportion of oocytes in “metaphase II” in the group “estradiol- and progesterone-dominant”.

Results of experiment II:

1. The distribution of the cumulus expansion after maturation shows two particularities: The number of naked oocytes in group “two” is smaller than expected. This could be observed already before maturation. On the other hand in group “minus one/one” there were found more “compact oocytes” than expected.
2. The existence of perivitelline space deviated in this experiment in several instances from expectation. In group “five” there were found more oocytes “with perivitelline space”. Otherwise the results in the category “questionable” are higher in the group “nil/one” and “six” and lower in group “one” than expected.
3. When interpreting the results of the test stage of meiosis in general it has to be considered that a large portion of the coloration cannot be correlated to a single cause. However, the results demonstrate that in group “minus one/one” and “nil/one” fewer oocytes were in the “germinal vesicle stadium” than expected. In contrary group “five” realizes more oocytes in this stadium. Group “one” contains above average oocytes in “metaphase I and II” and less oocytes in the category ”not allocable”.

Result of experiment III:

1. The distribution of cumulus expansion does not show any parallel development in the experiment one and three.
2. However, in the distribution there was found to a small degree parallel development in respect of perivitelline space in the experiment one and three.
3. The distribution of stage of meiosis does not show any parallel development in the experiment one and three.

Total:

The distribution of factors which deviate from expectation shows following influence: A general declaration of positive or negative influence of groups is not possible because no group was conspicuous in all categories.