



Exploratory project
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Coordination

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Plants as alternatives to synthetic hormones for estrus synchronization in pig farms

The asynchronous estrus and farrowing in organic pig farms complicate animal management, increase workload, reduce farm performance, and impact the homogeneity of piglet weaning weight and age. Developing alternatives to synthetic hormones, which are banned in organic farming, would make it possible to synchronize the cycles of females and facilitate herd management.

The aim of the VÉGÉTRUIES project was to test two plants with a progestogen effect: chasteberry fruits (*Vitex agnus-castus*) and walnut leaves (*Juglans regia*). The premise was that the introduction of these phytoprogestogens into the diet of gilts (young sows) would prolong the luteal phase, and that their discontinuation would induce a resumption of the cycle and synchronization of estrus (heat).

The first results consisted of identifying and quantifying the phytoprogestones in these plants:

- The analysis of flavonoids showed that chasteberry fruits contain kaempferol and apigenin, and that walnut leaves contain large amounts of kaempferol. These flavonoids interact with the progesterone receptor and elicit progestin effects.
- The analysis of steroids revealed that chasteberry fruits contain low levels of progestogens, whereas walnut leaves contain high concentrations of pregnenolone, progesterone, 5 α - and 20 α -dihydroprogesterone.



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- The analysis of phytosterols showed that chasteberry fruits and walnut leaves contain cholesterol, campesterol, β -sitosterol and stigmasterol, that are precursors for steroid hormone biosynthesis.



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The second result entailed the distribution of the chasteberry fruits and dried walnut leaves in the form of pellets in the feed ration of cycled gilts between the 12th and 18th day after their estrus (D12 and D18).

- Detection of estrus by males in the morning and evening from D13 onwards made it possible to measure the interval between two estrus cycles. This interval was not significantly different between the control group and the chasteberry or walnut group, but it was significantly longer for the group that received synthetic progestogen ($p < 0.05$).
- Blood samples taken on D11 and D18 showed a decrease in the concentration of progesterone in the plasma of gilts in all groups between D11 and D18, but with a significantly higher average concentration on D18 for the walnut group ($p < 0.05$).
- An analysis of plasma steroid levels on D11 and D18 showed a significant decrease in the concentration of pregnenolone, progesterone, and all its metabolites between D11 and D18 for all groups. In the walnut group, concentrations of progesterone and all its metabolites on D18 were significantly higher than in the control or chasteberry groups.

In conclusion, these plants did not enable synchronization of the gilts' cycles under these experimental conditions. Other routes of administration are currently being considered.

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