

## **Intake of soil and grass by sows on pasture.**

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The intake of grass and soil by lactating sows has been shown to be significant. This ascertaintment encourages to maintain the quality of the plant cover in order to favor the intake of grass and to limit this of soil.

In French organic farming systems, sows are mainly reared in free ranged on grass covered plots (according to Casdar Porc Bio in 70% of farms during gestation and/or lactation). A study carried out in 1998 at the experimental station “La Trinottières” have shown that pregnant sows spent a significant time outside (Guilloux et al. 1998). In order to refine this data obtained a behavior study, an experimentation have been carried out in 2012 in the same farm encompassed the project ICOPP. This study has allowed a first estimation of the intake of grass and soil by free-ranged lactating sows.

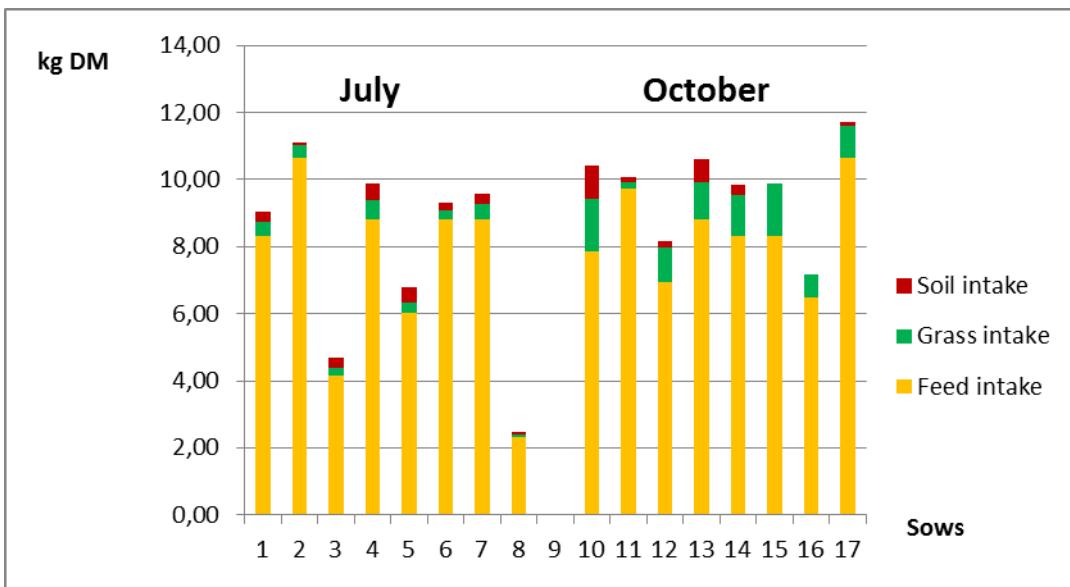
### **MATERIAL & METHODS**

Two groups of 8 sows (LF x DR) x LW or LW x LF) have reared according to an organic farming system been enrolled to evaluate the intake of grass and soil. Each sow had a plot of 500 m<sup>2</sup> with a straw bedded house. The animals have been fed *ad libitum* with a commercial feed right after parturition. Water was available *ad libitum*. The intake of grass and soil has been estimated at two periods: the 5<sup>th</sup> of July and the 25<sup>th</sup> of October. At these dates have been sampled feed, grass (5 elementary samples collected on each plot at the height of 2-3 cm), individual feces and soil (3 samples per plot at a depth of 20 cm). Soil samples have been dried at room temperature. Samples of grass and feces were freeze dried and crushed at 1 mm. The estimation of the intake of grass and soil was carried out in two steps: first the contribution of grass DM in the diet (i.e. grass and feed) using the profile of n-alkanes and then the contribution of soil in the total intake (i.e. soil, grass and feed) using the concentration of acid insoluble ash (AIA). As the amount of feed has been weight, the proportions of grass and soil can be multiplied to get the quantity of intakes per sow and per day. The use of markers needs their very low digestibility in order to ensure a good fecal recovery. This has been shown for AIA. As such measurements could not be carried out long enough on this farm (sows should have been attached at least during 10 days what is forbidden in organic farming systems), we used the recovery rates reported by Scottish authors (Wilson et al, 1999).

### **Huge variability in grass intake**

The animals ingested without respect to the considered period on average 7,8 ( $\pm 2,2$ ) kg of feed dry matter (DM) per sow and per day. The amount of ingested grass varied between 0,2 and 1,6 kg DM per sow and day which highlights the large variation in the response of the animals (figure 1). The sows ingested less grass in July in comparison to October (respectively 0,4 and 1,0 kg DM/day, P<0.05).

**Figure 1 : Composition of daily intake per sow and period**

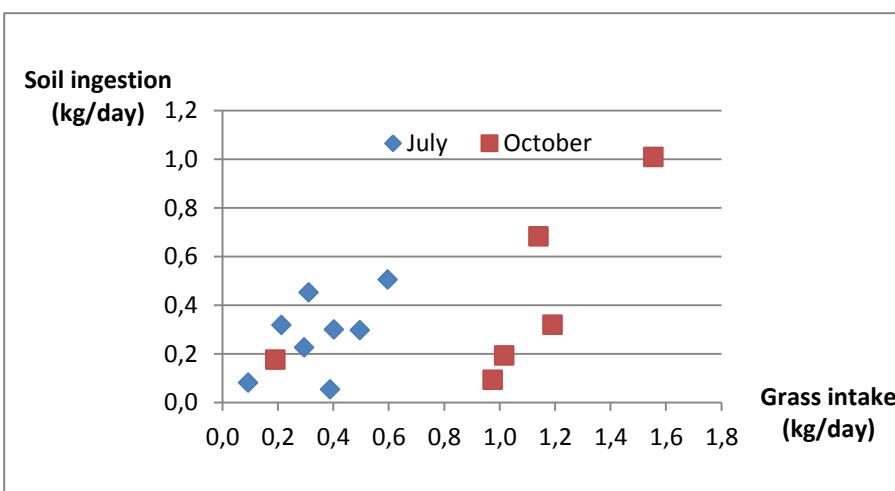


Different reasons could explain this difference: the summer heat (22,5°C max temperature in July versus 12,2°C in Autumn) may reduce the intake although no effect was observed on Feed. Moreover, grass was less available and lightly more fibrous what can also decrease the intake. Finally, the parity range of sows differed slightly between both periods.

#### Average soil intake 300g per day

The soil intake was on average 0,3 kg per day without a significant difference between both periods despite a slight tendency of higher intakes in October (0,28 versus 0,41 kg/day). Nevertheless, individual variations were smaller in July than in October (respectively 0,16 and 0,36 kg/sow and day). By the way, an outlier of 1 kg daily soil intake has been observed for one sow in October. Despite the necessity to confirm the results of this first study and our approach represents only a snapshot of the intake on our measurement days, our values allow to give a first order of magnitude for soil and grass intake in free ranged systems. The grass intake seems to vary depending on the quality of the growth of plants, what is largely described in ruminants. The soil intake seems to be restricted to 300 to 400 g per sow and day in good conditions on pasture. Nevertheless, strongly increased values can be reached confirming some very high values in adverse conditions reported in the literature.

Figure 2 : Soil and grass intake



The maintenance of a good quality plant cover is therefore an important mean to favor the grass

intake of sows and to reduce the risk of exposure of the animals to pollutants via soil intake. Further studies are programmed to know more about the nutritional supply by pasture grass.