**Supplementary material\_Animal journal**

**The potential interaction between body condition score at calving and dietary starch content on productive and reproductive performance of early-lactating dairy cows**

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Supplementary Material S1. The liver functionality index (LFI) calculation was conducted in 2 steps. The first step considers the concentration values (V) of the 3 parameters detected on d 3 (V3) and changes in concentrations between d 3 and 28 (V28). The albumin and cholesterol index was calculated as 0.5 × V3 + 0.5 × (V28 − V3), with albumin and cholesterol levels on d 3 postpartum (PP) representing 50% and the reduction between d 3 and 28 the remaining 50% of the partial LFI index. Similarly, the bilirubin index was calculated using concentration values as 0.67V3 + 0.33 (V28 − V3), with bilirubin level on d 3 (V3) PP representing 67% and the reduction between d 3 and 28 (V28) the remaining 33% of the partial LFI index. In the second step, the LFI was calculated according to the formula: LFI = [(albumin index − 17.71)/1.08 + (cholesterol index − 2.57)/0.43 − (bilirubin index − 6.08)/2.17].

Supplementary Material S2. The Statistical model can be summarized as follows:

Yijkl = μ + αi + βj + τk +(αβ)ij + (ατ)ik + (βτ)jk + (αβτ)ijk + eijk,

where Yijk = dependent variable, μ = population mean, αi = effect of the diet, ßj= effect of the body condition score (BCS), τk= effect of the sampling time, (αβ)ij= interaction between diet and BCS, (ατ)ik= interaction between diet and sampling time, (βτ) jk= interaction between BCS and sampling time,(αβτ) ijk= interaction of diet, BCS and sampling time and eijk = residual error.