

***Economic resilience and efficiency indicators of conventional and organic dairy farms across Europe***

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The Horizon 2020 project GenTORE is investigating proxies for and improvement of resilience and efficiency traits in dairy and beef cattle. In this context also the farm level is assessed, first, as the environment for the animal phenotypes, and second, with regard to the farms' economic resilience and efficiency itself. The results presented here show the effect of compliance with organic production standards on dairy farms, which was assessed in terms of their economic efficiency and profitability across four geo-climatic classes in Europe, using FADN data from 39,000 dairy farms. Substantial evidence shows that organic certification contributes to environmentally safe production conditions. Less is known about its effect on the economic performance and resilience of farms. While yields might be lower in several instances, costs and benefits behave differently. The effect of certification is estimated through entropy balancing, an innovative method to achieve covariate balance in observational studies. To balance treatment and comparison, a range of control variables are used: Farm size, economic size, degree of specialisation, share of family labour, the share of forage and fodder areas and altitude. To also account for the heterogeneity of dairy farming in Europe, a class splitting model is used to allocate farms to four distinct groups, each exhibiting more similar characteristics in terms of production technology and climate than the entire sample. While differences in efficiency between conventional and organic certified farms are relatively small across the 4 classes, ranging from no significant effect to a positive effect of 2%, impacts of organic certification on profitability are more pronounced, ranging from no significant effect to a positive effect of 47%. Besides environmental gains, organic certification can thus have potential as an institutional innovation for a profitable dairy economy. However, the balanced data shows slightly higher variance for the profitability of organic farms in three classes, which might suggest that economic resilience of organic farms is more limited than in conventional systems.