Master Thesis
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Degree programme
Master in Life Sciences

Field of application
Viticulture and Enology

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Process hygiene and oxygen control in bottling of wine

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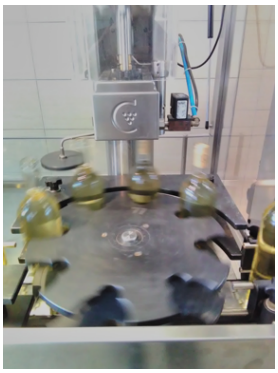
Objectives

Bottling is the final oenological step towards the commercialization of a given wine. It is therefore crucial to control all parameters since no further intervention will be possible. Any contamination, or excessive oxygen intake, if not detected, might have deleterious consequences on the wine, and drastically reduce its shelf-life. By using technologies such as luminescence and microbiological analysis, aim of this study is to develop a full audit protocol for wineries to control their bottling process and installations

Methods | Experiences | Results

Preliminary testing was conducted using the tools intended first to be used during bottling audits. The feasibility and efficiency of TPO calculation by oxo-luminescence, microbiological plate counts and ATPmetry were assessed. This preliminary phase was also intended to serve as a period to familiarize the author with the tools and to detect any eventual flaws that could intervene during a real audit in industrial conditions. Based on the technical considerations gathered by the end of this crucial steps, many deliverables have been conceptualized in order to create a complete protocol for auditing the efficiency of a bottling system in terms of oxygen management and hygiene, adapted to the Swiss wine industry. These deliverables included a preliminary questionary to be completed by the audited winery, a risk indicator based on the answers provided, a comprehensive list of the material needed, a HACCP canvas and finally a hands-on field protocol. Using the previously mentioned tools, real audits were conducted in three regions; Geneva, Vaud and Neuchâtel. These audits proved very useful to further develop the method and showed their utility in their context as they helped to detect flaws on inert gas system, they helped operators to adjust settings on their bottlings lines, they pointed out flaws in sanitation programs and they confirm the quality of previous maintenance procedures.



Observation of the closure and vacuum system whose malfunction was detected during the audit # 1 in the Geneva region of Switzerland.

A serie of bottles sampled from each filling head during audit #2 in order to confirm the quality of the maintenance completed of the bottling line prior to the audit