Master thesis proposal:

## Optimisation and Modelling of Cheese Production

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The Norwegian dairy producer TINE, is in the process of planning a new cheese factory in Cork, Ireland. The production start is planned for 2020. Therefore, TINE now seeks development in its productions methods and the goal is to develop a more standardised and independent production.

An alternative is to look at the possibilities for changing the production platform from batch based to continuous based. The advantages with continuous production is an increased efficiency in terms of energy, space and investment costs.

Cheese production is in general divided into 6 phases: acidification, coagulation, dehydration, molding & shaping, salting and ripening. For this thesis the first 3 phases will gain the main emphasis in favour of the 3 last phases, as they are highly mechanised.

The acidification of the milk is fermented by a bacteria culture and is crucial for the final taste and texture. To be able maintain a controlled acidification, the control of the stock culture and a stabile milk quality will become two main objectives for controlling the acidification phase. To what degree the stock culture is sensitive to fluctuations in milk quality and exposure of unwanted evolution remain to investigate.

In the coagulation phase a central point is establishing a sufficient reactor size and design to precipitate adequate amounts of k-casein prior to the start of the clotting stage.

The specific details for the level of specialization for the thesis is not decided yet, and will be developed during the literature research period.