

Aspects of Milk and Milk Foams on Dairy Based *Espresso* Coffee Hot Drinks

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SUMMARY

Cappuccino, *macchiato*, *latte* and *café au lait* are very popular coffeehouse beverages. Most of *espresso* coffees are consumed every day by adding milk and particularly milk-foam, originating the endless family of *cappuccino*-like drinks. The milk foaming, therefore, is an important quality determinant in the manufacture of dairy-based *espresso* hot drinks. In addition to *espresso* quality, milk type and its ability to form a stable foam with desired texture and rheological properties play a fundamental role in determining the quality of these products. Steam frothing of milk is used to produce a proper foam for many dairy-based *espresso* hot drinks. Chemical composition and processing such as protein and fat contents, heat treatments and technologies used, temperatures and operative conditions used to obtain the foam may strongly affect the foaming properties of milk. In the present work, milk steam frothing has been studied under strictly controlled experimental conditions. Data reproducibility has been obtained by fixing and optimizing the whole set of variables that may influence the final foam characteristics. We have then evaluated the importance of milk temperature on the foaming properties measured in terms of overrun values. The effect of two consecutive milk steam frothing processes on the overrun values and chemical composition have been also evaluated. Experimental results put in evidence the necessity of standardization of the foaming technique to get repeatable overrun values in the framework of comparison among different types of milk. Moreover, the overrun value has to be considered just as one of the features which makes a milk foam ideal for *cappuccino*. Steam-frothing determines a not negligible (up to 10% w/w) milk dilution as evidenced also by HPLC analysis of protein fractions after two consecutive foaming processes. Performance differences between pasteurized and UHT milks has been also carried out. Preliminary data suggest no significant differences, particularly if UHT milk are obtained by direct steam exchange method.