**Rapid and non-destructive determination of Ca and P in milk using WDXRF**

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**Keywords:** Mineral determination, Wavelength Dispersive X-ray fluorescence (WDXRF), Calcium, Phosphorus, milk coagulation

Calcium (Ca) and phosphorus (P) are two important minerals in milk, playing an essential role in human nutrition (Manuelian et al., 2018). Concentration of Ca and P in milk is then extremely important in the coagulation process, as they bond together to the casein micelles, influencing curd structure and stability and eventually to the quality of cheeses (Malacarne et al., 2014). Milk is routinely analysed for main components (Fat, Protein and lactose) by mid infrared spectroscopy and attempts to use the same technique for minerals have shown limited performances (Toffanin et al., 2015). X-ray fluorescence (XRF) is used as rapid and non destructive spectroscopic technique specific in the determination of elements. Thirty samples were collected from single cows at different very diverse dairy farms in Northen Italy. Triplicates were placed in 50ml vials and stabilized with the addition of Bronopol. One sample was sent to commercial lab for mineral determination by ICP-OES, one sample was frozen and stored at -20 °C for backup and the third subsample was scanned on a wavelength dispersive XRF (WDXRF) instrument (S6 Jaguar, Bruker AXS, Milan). Samples were poured in cups over thin prolene X-ray film, placed in the scanning chamber saturated with Helium and scanned at 30KV for P determination and at 50KV for Ca determination, with total scanning time of 3 minutes. Calibrations were developed using Spectra.Elements Advance v.3 software of Bruker. The results of this study shows that prediction models using XRF spectroscopy was excellent for Ca and P, with coefficients of determination greater than 0.90, RPD greater than 3.5 and SECV of 32 and 52 mg/kg for Ca and P respectively. WDXRF is a valuable method at improving the evaluation of milk quality for mineral composition which can be used to improve coagulation properties of milk.

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|  | Chemical Composition | | | | | WDXRF calibration | | | | | |
| Trait | n. | Min | Max | Mean | SD | RSQ | SEC | Slope | Bias | RPD |
| Ca (mg kg-1) | 30 | 1000 | 1800 | 1234.67 | 151.92 | 0.96 | 31.46 | 0.93 | -3.93 | 5.12 |
| P (mg kg-1) | 30 | 900 | 1610 | 1094 | 149.15 | 0.93 | 52.68 | 0.81 | -11.13 | 3.82 |

**Acknowledgements:** First Author gratefully acknowledges receiving funding from programme name (POR FESR 2014-2020: PG/2019/916776).