Which new traits are expected to be available in the near future?

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For several decades breeding goals in cattle were strongly linked to increases in milk production. Due to negative genetic correlations of milk yield with fitness traits there was an accompanying reduction in genetic merit for functional traits. Herd management is therefore challenged to compensate these effects in order to allow economically feasible milk production. Functional traits, such as direct information of cow health, have also increased in importance because of animal well-being and consumer demands for healthy and natural products. Sustainability and efficiency are also increasing in importance because of growing competition for high-quality, plant-based sources of energy and protein. For data recording efforts to succeed it is crucial that there is a balance of effort with benefits. To keep the labor associated with recording reasonable it is important that existing data sources be used. Examples include the use of milk composition data to provide additional information about the metabolic status or energy balance of the animals. Recent advances in the indirect use of mid infrared spectroscopy have to be mentioned. Other data sources already may exist in countries with compulsory recording of veterinary treatments and drug use. Additional sources of data outside of the farm include e. g. slaughter houses, and veterinary labs. On farm level huge amounts of data are increasingly available from automated and semi-automated milking- and management systems. In order to develop effective selection programs for new traits, the development of large databases is necessary.

How dairy farmers can benefit from new genomic tools

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To date, genomic selection has been successfully applied to male pathways of selection in dairy breeding schemes. Farmers can already achieve higher annual rates of genetic gain through using genomically tested bulls in their herds. As genotyping costs continue to fall, it will likely become increasingly popular to capture extra value from genotyping females. Genotyping females can improve farmer profitability by assisting in: (1) the identification of elite females (potential bull mothers); (2) identifying the best heifers to become herd replacements; (3) providing better prediction of the true value of an animal's genetics, that may correlate to sale price; (4) achieving certainty of parentage of individual cows; (5) avoiding inbreeding through the use of genomic assisted mating plans, where relationships between animals are quantified at the genomic level; (6) avoiding genetic defects that could arise from mating cows to bulls that are known carriers of genetic diseases that are the result of a single lethal mutation; and (7) enabling selection for special interest genes, such as A2 or the red factor.