

Flash BMP[®]: Calibration for the Biochemical Methane Potential of solid organic waste using Near Infrared Spectroscopy (NIRS)

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Why recycling organic waste?

- ✓ Reduction of the waste quantity
- ✓ The production of methane for use as a fuel (biogas production by a process known as anaerobic digestion)

Why measuring BMP (Biochemical Methane Potential)?

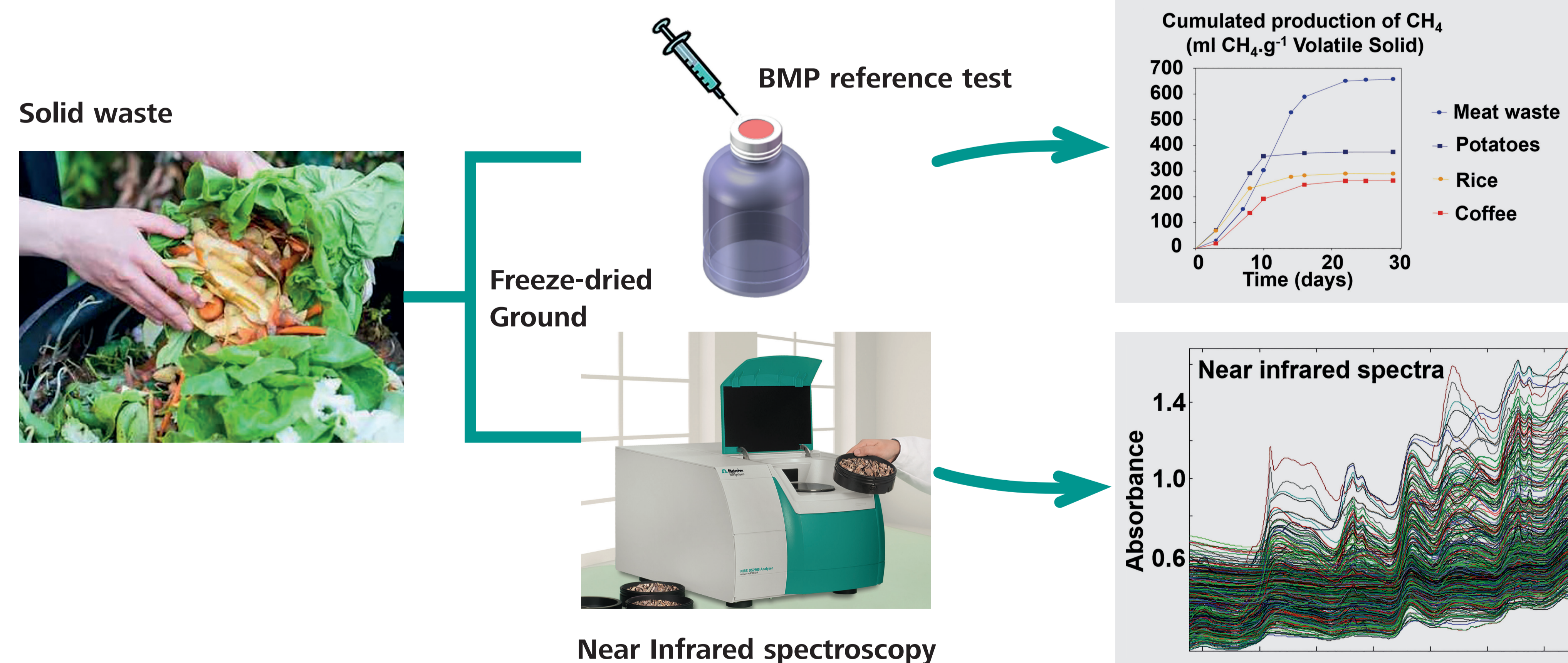
- The methane production optimization in industrial digesters requires to determine the methane potential of waste
- The BMP test is a commonly used parameter for waste characterization. It determines the volume of methane a waste can potentially produce in anaerobic conditions
- Traditionally, the methane potential (BMP) is measured using the 30-day standard biological test by fermentation (Angelidaki et al. 2009)



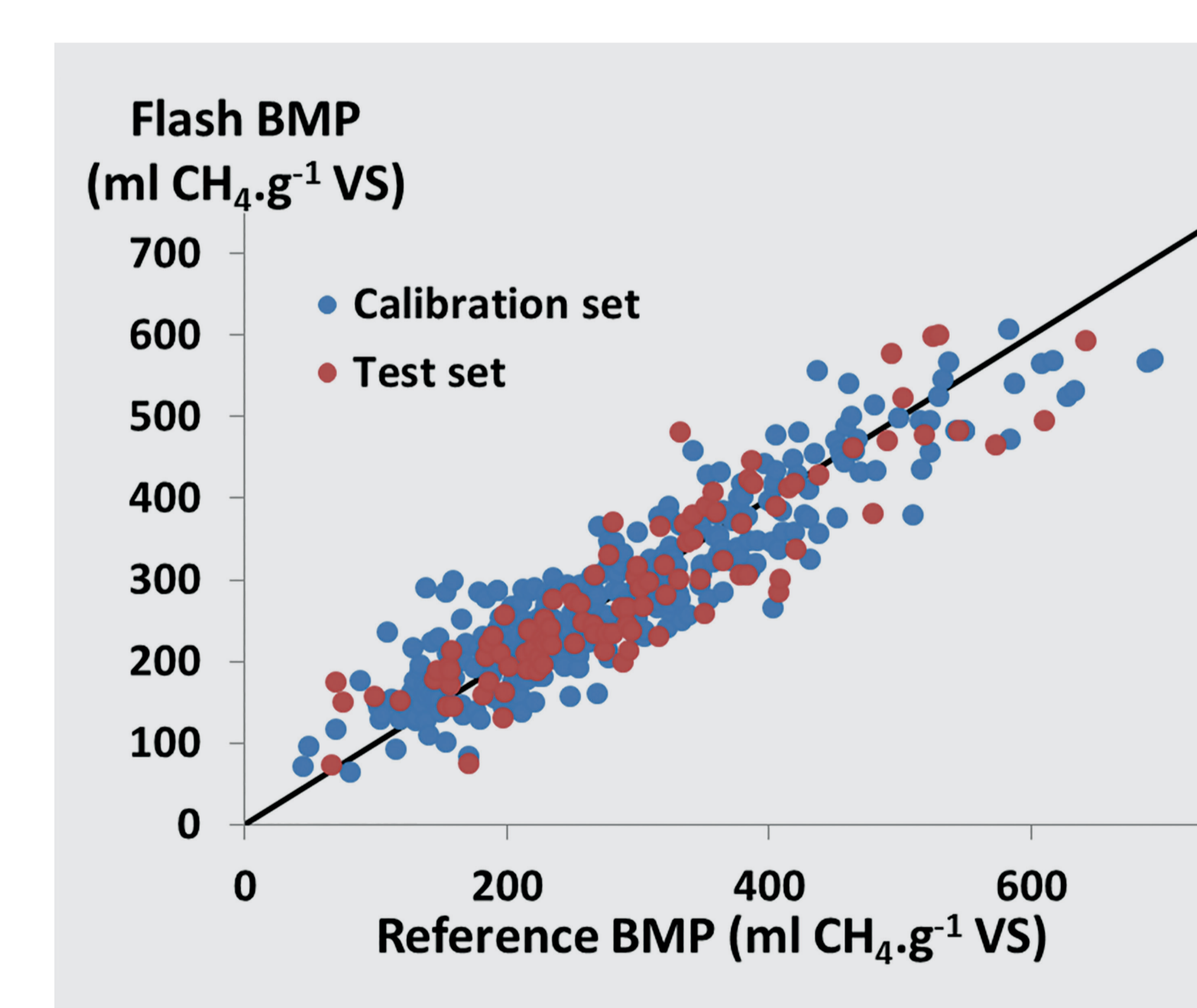
Objectives of Flash BMP[®] using NIRS

- ✓ Replace the costly and lengthy (>30 days) reference measurement of BMP by fast NIR assessment
- ✓ Improve the industrial anaerobic digester monitoring (Lesteur et al., 2010)

Material and Methods



Results and Conclusions



- ✓ Instantaneous measurement after 2 days of sample preparation
- ✓ Highly representative substrate sampling
- ✓ No consumables
- ✓ Large database: 500 samples
- ✓ Range: [20–700] ml CH₄.g⁻¹ VS
- ✓ Model accuracy: 15–20% (similar to the reference method)
- ✓ Model validity: Green waste, agricultural waste, energy crops, agro-industrial waste, municipal solid waste, sludge

References

- Angelidaki, I., Alves, M., Bolzonella, D., Borzacconi, L., Campos, J. L., Guwy, A. J., Kalyuzhnyi, S., Jenicek, P., and van Lier, J. B. (2009) Defining the biomethane potential (BMP) of solid organic wastes and energy crops: a proposed protocol for batch assays. *Water Sci. Technol.* 59(5), 927-934.
- Lesteur, M., Bellon-Maurel, V., Gonzalez, C., Latrille, E., Roger, J. M., Junqua, G., and Steyer, J. P. (2010) Alternative methods for determining anaerobic biodegradability: A review. *Process Biochem.* 45(4), 431-440.

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