

NIRS application as a screening tool for heat treatment of manure

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Abstract text

The high intensity of livestock production in the Netherlands gives rise to a surplus of minerals. Export of manure fractions is stimulated to reduce the local environmental stress. International transport of manure or manure derived products requires a sanitation step to prevent the distribution of any infectious disease. Heating the manure for one hour at 70 degrees Celsius is generally accepted as a practical guideline. Legal requirements are the absence of *Salmonella* spp and low counts for *E.coli*'s in the manure. To estimate these parameters sophisticated and time consuming sample taking and sample treatment are required. Results are only available after several days.

In previous research it was shown NIRS measurements can be used to distinguish between heated and unheated manure (Derikx et al, 2017). Solid fractions, originating from both pig and cattle slurries after mechanical separation, were measured directly after separation and after heat treatment under well controlled laboratory conditions. Based on the results a mathematical model was built.

As a follow up a field setup was constructed as a screening tool based on a handheld NIRS scanner in combination with an application on a smart phone. This combination provides the user with an easy to perform field inspection tool, providing on line results. Inspectors from The Dutch food and consumer product safety authority (NVWA) have gathered valuable experiences over a pilot period. With this, both the software application and the mathematical model have been improved. At this stage the results can only be used as a first screening. For official enforcement of the law, microbiological enumeration is still required. Future work will focus on improving the reliability of the screening results with the final goal on the long term to replace the microbiological procedures.

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References

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