



APPLICATION NOTE | DDS CALORIMETERS

C1.4 CALORIFIC MEASUREMENT OF FOOD

SAMPLE – CORN DRIED DISTILLERS GRAIN COMPOSITE

INTRODUCTION

Many institutions are doing research and development on food. The aim is to improve the nutritional value of the food. The parameters may be to compare different foods or different manufactures or to generically improve the food. Other aspects may be to improve the digestion and energy absorption of animal feeds.

Part of the research involves determining the calorific value of the food. The calorific value of a particular food is the same as the energy content of that food.

The food can be for either human or animal consumption.

Institutions performing this type of research include:

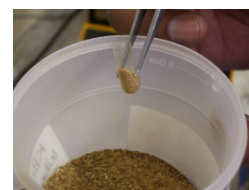
- Animal and Dairy research
- Department of Agriculture
- Universities
- Technicons
- Government or private food industries

SAMPLE PREPARATION

A calorimeter is used to determine the calorific value of any substance that can be ignited. This substance is in powder form.

SPIKING

This sample needs to be run using the “Spiking” method of ignition. In this method Gelatine Capsules are used to burn the sample. The Gelatine Capsule burns easily and ignites the sample; the energy of the Gelatine Capsule is removed from the calculation of the calorific value. Please refer to the Operating Manual for the procedure on how to use Spiking.



ANALYSIS

Once the sample has been prepared the determination can be carried out in the normal method.

Keep the total mass of the sample between 0.2000 to 0.2500grams.

Fill the vessel with 1.5KPA oxygen. Use a very slow feed. This will prevent the capsule from being blown out of the crucible.

Ensure that the firing cotton touches the capsule. During the filling process do not knock the vessel, ensuring that the cotton does not move off the capsule.



When substances are being analysed for the first time always check after the determination for any residue on the walls of the vessel and check that the entire sample has burnt.

After each determination clean the inside of the vessel, the crucible and strip the lid assembly before starting the next determination. All residue needs to be removed after each CV. Clean the residue from the Centre Electrode and inspect the top and bottom o-rings after every 4 CV's.

RESULTS

Corn Dried Distillers Grain Composite



RESULT	MASS	SID	DATE	BN	INIT DRIFT	FIRING TEMP	AMBIENT TEMP	RS	FINAL TIME
21.011	0.3000	3	09/2009	123	0.0015	21.5	22.2	OK	3.1
19.589	0.3000	3	09/2009	4	0.0011	22.5	23.0	OK	3.1
19.969	0.3000	3	09/2009	4	0.0019	21.4	23.5	OK	3.1
21.237	0.5000	3	09/2009	123	0.0009	23.0	23.5	OK	3.1
21.092	0.5000	3	09/2009	4	0.0019	21.4	23.6	OK	3.1
Average MJ/Kg = 20.580									

CONCLUSION

The calorific value of almost any food type can be determined. Calorific value analysis of a food type is one of many results required to determine the nutritional value of any food for either human or animal consumption.