Product Information Guide

Meat Fat Meter
MODEL MFM-1092
Large Head Model

General Product Description
with Step-By-Step Guide

INTRODUCTION

General Description

THE DISTELL FATMETER was developed in response to demand from various customers for a meter that could measure lipid content of fish, meat and poultry products simply, and non-destructively. The hand held instrument is placed in contact with the sample and the fat/oil content is displayed on the instrument's digital readout, providing instant processing or quality control information. The value is also stored in memory for later downloading to computer. These features are invaluable for organisations requiring collation and reporting information, especially where HACCP and TQM regimes are in force.

There are calibrations available for a large number of fish and meats of commercial importance. There is also the option of having Distell prepare a specific calibration of your choice, where required.

The instrument is non-destructive and non-invasive in use, and for this reason can be used equally well on… live or dead fish, whole pieces of meat, or minced meat products.

Please note however, that the instrument cannot measure samples that are frozen, and it is necessary to fully defrost such samples before measurement.

Principle of Operation

The lipid content of naturally occurring meat is related to the water content, and the measurement of one can serve to determine the other if the relationship is known. THE MEAT FATMETER utilises this fact in establishing the fat content.

The instrument uses a microstrip sensor which is sensitive to the water content of the sample. Using stored calibration data the instrument converts the response of the sensor to a displayed percentage fat/oil content.

The principles of the method were defined after a number of years of research and development conducted by the Torry Research Station (TRS) of the UK's Ministry of Agriculture, Fisheries and Food (MAFF) in Aberdeen, Scotland. Calibrations were obtained using large numbers of meat samples covering many species. Results of this work and other related research have been published in the scientific and technical press by staff of TRS. This instrument has been further developed by DISTELL.COM. The Fatmeter is covered by various patents in several countries.

Fatmeter Update

The first models of the Fatmeter were supplied to customers within the fish and meat industry in July 1992. Since then the Fatmeter has become universally known and is in use throughout the world.
Distell has received invaluable feedback from customers about the use of the Fatmeter in the field.
This allows us to constantly improve and refine the Fatmeter and to give you hints and tips on its use.
Also, we received numerous enquiries regarding the operation and accuracy of the Fatmeter, and how the results compare with the current, historical methods used in industry.

It would seem that the sampling and analysis procedures are far from standardised and varies from country to country, and even from company to company within these countries. Even where the same laboratory equipment is used, there are different sampling techniques apparent, which seems to give varying results.

This guide is not fully comprehensive, but is provided simply to help you understand the Fatmeter, how it operates, and how to eliminate factors that may affect your results. Please refer to user and technical manuals supplied or our website www.distell.com for further details.

If, having read supplied literature, you still have a query or a problem, please do not hesitate to contact Distell for further assistance.

Accuracy of Results

The accuracy of the FATMETER depends upon the fat/oil content of the sample being measured and ranges from an uncertainty in the fat content of (+/-) 1% (95% confidence interval) at low levels to (+/-) 4% at very high levels (greater than 45%).
Therefore it is advisable that the operator follows the measurement methodology rigorously, and always takes readings as described in wall charts supplied.

Accuracy Guide
Fat/Oil Reading Accuracy

2 to 15%	from.. ± 0.5%,	rising to.. ± 1.0%	(13 -15% at 14%)
16 to 30%	from.. ± 1.0%,	rising to.. ± 2.0%	(28-32% at 30%)
31% and above	from.. > ± 2%,	rising to.. ± 4.0%	(46-54% at 50%)

The results gained will allow the operator to take swift decisions regarding feeding or processing of the fish species being measured.

Step-By-Step Guide

Fatmeter Kit - Contents

Your Fatmeter kit comprises the following items…
- Meter Unit
- Power Supply / Charger
- Check Pad
- Datacom Cable
- USB Flash Drive
- User Manuals and Measurement Charts
- Carry Case

Please take good care of the meter. It is a measurement instrument and should be handled carefully.
On the sensor head, there is a PTFE film. On no account should this be removed or broken.
Damage to the PTFE film will invalidate readings.

Meter Unit – Front View

LCD Display

This displays current calibration setting, fat %, instructions and prompts, readings and low battery indication.

On / Off Button
Used to switch instrument ON / OFF

Download & Power Socket
The 7-way socket on the side of the meter, serves THREE Functions…
- Data download socket, for transferring data to PC, using cable supplied.
- External power
- Charging internal batteries.

Microstrip Sensor… Microstrip sensor is placed in contact with the sample product, in order to take measurements.

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Meter Unit – Back View

Read Button (Yes)

• Press this to take a reading

• Press to answer "Yes" when using Software Menu

Reset Button (No)

• Press to reset the measurement routine, or to abort an incomplete series of readings

• Press to answer "No" when using Software Menu

Battery Charger Unit

Only the unit supplied with your kit should be used to charge the battery pack, or power the meter.

This is connected to the 7-way outlet on the meter. The charger supply unit simply plugs into the mains socket, accepting input mains voltage from… 100v–240v AC, 50–60 Hz. The charger unit comes complete with various plug configurations for use around the world.

A Red LED will illuminate when charger / power supply is switched ON. The battery pack should be fully charged after a period of 12 hours. When charging is complete, first disconnect the charger from the mains and then from the meter.

Power Supply

The Battery Charger Unit can also be used as a desktop power supply. This will power the meter + charge the internal batteries.

Check Pad

All scientific instruments need regular calibration. In the case of the Fatmeter an annual calibration is recommended. Where the meter is subject to intensive use, a twice yearly calibration check is recommended.

So that you can be sure that the meter is operating to specifications, it is always best to take measurements on the check pad, PRIOR to commencing work. The check pad provides the user with a quick daily check that the calibration has not changed significantly since last calibration. It should be noted, however, that the results obtained do not verify your meter's precise calibration, but they do give an assurance that there has been no significant change.

The pad has two rectangular slots which provide a representative reading of the high and low range of a stated species selection. A series of eight readings should be taken in each of these slots (firm pressure should be applied). The average readings obtained should fall within ± 2% of the values stated on the pad.

Because of the compressible nature of the pad, different operators may obtain slightly different results on the check pad, using the same instrument. It is therefore recommended that one person be made responsible for this daily check, so that consistent daily checks are carried out.

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Data Cable

Always use the data cable supplied for downloading to computer. Connect the 7-way plug to outlet on meter, and the other end directly into a serial port on your computer.

USB Flash Drive
The Flash Drive contains the User Manuals, Data Management Software, Measurements Charts, and other useful information.

User Manuals & Measurement Charts
A Hard copy of User Manuals, Measurement Charts & Calibration Certificate is supplied as part of kit.

Carry Case
The Fatmeter Kit is supplied in a robust carry case, and comes complete with 2 keys for security of your Fatmeter.
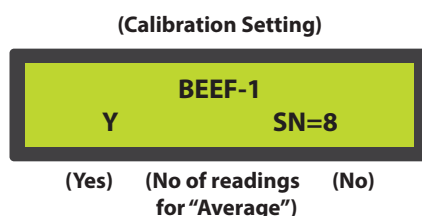
Getting Started

Verify that battery has been charged.

Switch on…

Switch on the Meter and allow to meter to cycle through start up routine (approx 15 seconds). Please allow 1 minute for meter to fully warm up before use.
The Meter is now ready for use, and the display should have defaulted to the last calibration setting used.
The screen should show as follows...

(Calibration Setting)

```
┌─────────────────────────┐
│        BEEF-1           │
│   Y              SN=8   │
└─────────────────────────┘
```

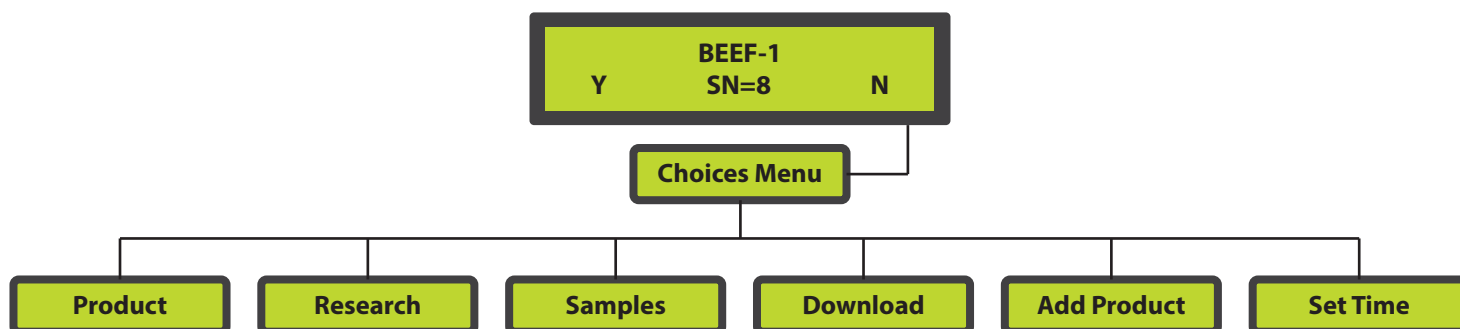(Yes)   (No of readings   (No)
          for "Average")

At this point it is worth checking that you have downloaded any previously collected data measurements, and that you have cleared the memory. Please refer to the Menu Structure below, for guidance on how to access Download Section, via the Choices Menu.

Menu Structure..Overview
To access "Choices Menu"...
From the screen at Switch-On, choose "NO". The Choices menu screen will appear in the order shown below. There are SIX Options. Cycle through the options until the correct one is displayed and press "YES".
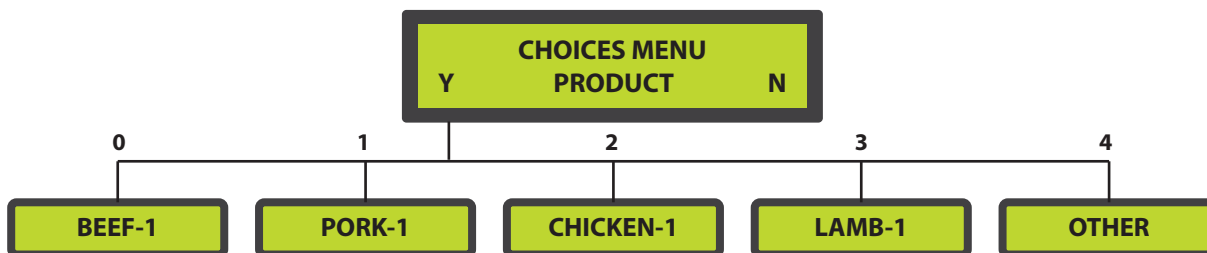
```
┌─────────────────────────┐
│        BEEF-1           │
│   Y      SN=8       N   │
└─────────────────────────┘
```

Choices Menu

| Product | Research | Samples | Download | Add Product | Set Time |

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Menu Structure - Overview

Product Menu

In "PRODUCT" Menu your Fatmeter is supplied with your chosen Meat Calibration Settings. Each calibration is assigned a number, normally between 0 – 4. Simply choose the number that corresponds with the calibration setting on your index card (Supplied). The display will show the calibration selected.

```
                    CHOICES MENU
              Y       PRODUCT       N

      0         1          2          3          4
   ┌──────┐ ┌──────┐ ┌────────┐ ┌──────┐ ┌──────┐
   │BEEF-1│ │PORK-1│ │CHICKEN-1│ │LAMB-1│ │OTHER │
   └──────┘ └──────┘ └────────┘ └──────┘ └──────┘
```
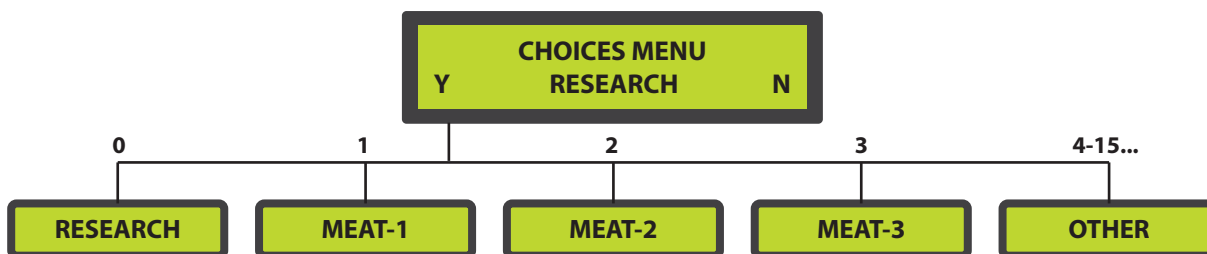
Research Menu

In "RESEARCH" Menu your Fatmeter will normally be supplied with the following settings:
RESEARCH-1, MEAT-1 to MEAT-15. Each setting is assigned a number, normally between 0 – 15. The Research Setting is used to create a new calibration setting.
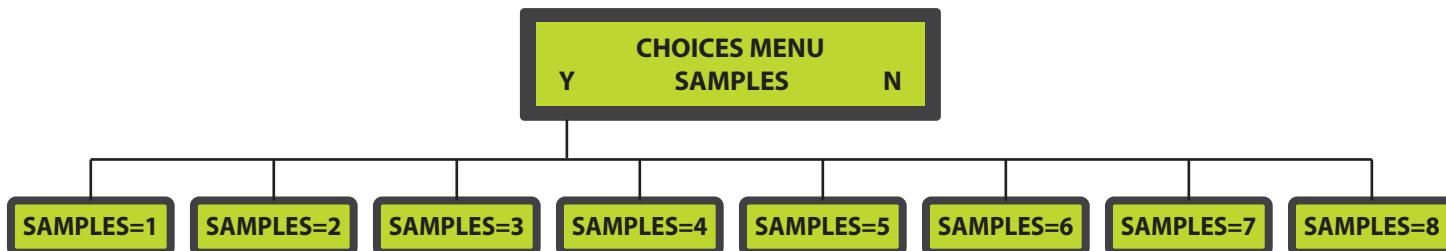Settings:
MEAT-1 to MEAT-15 can be programmed with your calibration data where required. Full details are available in "METER CALIBRATION PROCEDURE" section of this Manual. Simply choose the number that corresponds with the calibration setting on your index card. **The display will show the calibration selected.**

```
                    CHOICES MENU
              Y       RESEARCH      N

      0         1          2          3         4-15...
   ┌────────┐ ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐
   │RESEARCH│ │MEAT-1│ │MEAT-2│ │MEAT-3│ │OTHER │
   └────────┘ └──────┘ └──────┘ └──────┘ └──────┘
```

Samples Menu

For greatest accuracy you should always choose... Samples = 8, and take eight measurements from around the meat sample. For single measurements you should choose... Samples = 1, and measure at recommended measurement site. **The display will show the number of samples selected.**
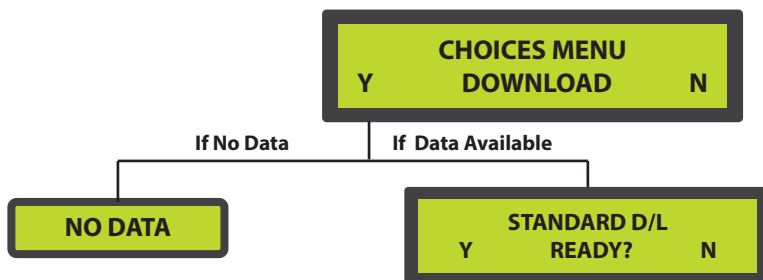
```
                    CHOICES MENU
              Y       SAMPLES       N

 ┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐┌────────┐
 │SAMPLES=1││SAMPLES=2││SAMPLES=3││SAMPLES=4││SAMPLES=5││SAMPLES=6││SAMPLES=7││SAMPLES=8│
 └────────┘└────────┘└────────┘└────────┘└────────┘└────────┘└────────┘└────────┘
```

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Menu Structure - Overview

Download Menu

Downloads the following data... **Sample Reference, Time, Date, Calibration, Individual readings, Average.**
The data is available in a spreadsheet format, and is saved as a text file in comma delimited format for use with other spreadsheet programs. Full details are available in... "DATA MANAGEMENT SOFTWARE" section of User Manual.
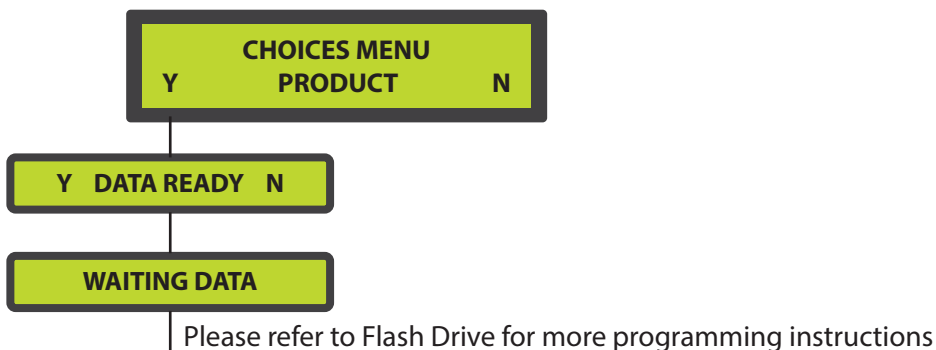
```
              CHOICES MENU
       Y        DOWNLOAD         N
```

If No Data   If Data Available

```
      NO DATA                    STANDARD D/L
                          Y         READY?        N
```

Add Product...

Using this menu provides the ability to programme the Meter with additional calibrations. This facility is especially useful for Researchers and Others who wish to:
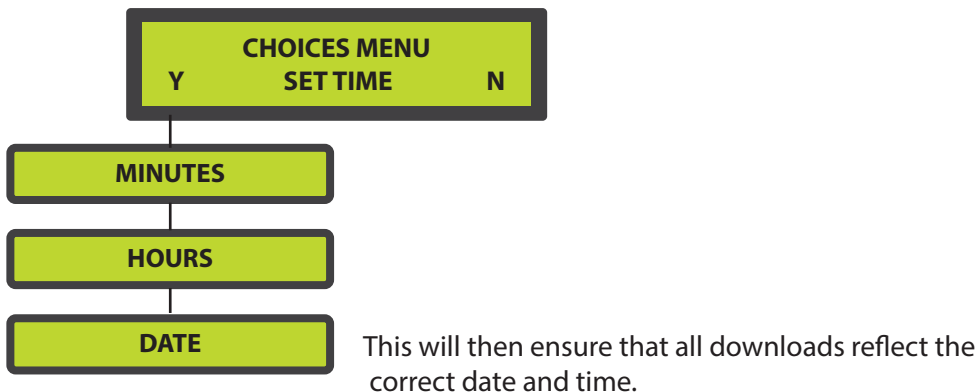   • Refine existing Meter calibrations
   • Create a new meat calibration setting

Full instructions on how to use this facility is available later in this manual, and is also available on your USB Flash Drive under the title METER CALIBRATION PROCEDURE.

```
             CHOICES MENU
       Y        PRODUCT         N
```

```
      Y   DATA READY   N
```

```
         WAITING DATA
```
Please refer to Flash Drive for more programming instructions

Set Date & Time...

You should reset minutes, hours and date when you first receive the meter.

```
            CHOICES MENU
       Y        SET TIME        N
```

```
           MINUTES
```

```
            HOURS
```

```
            DATE
```
This will then ensure that all downloads reflect the correct date and time.

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Calibration Check

Each morning it is important to check that the calibration of the fatmeter HAS NOT CHANGED from the previous check. The check is carried out using the CHECK PAD supplied.

Procedure is as follows…
- Select the correct calibration from the menu. Press RESET on the fatmeter to confirm that you have selected the correct calibration setting. The chosen setting (eg. BEEF) should agree with the calibration setting stated on the check pad.
- There are TWO ranges on the check pad. High range and low range.
- Locate the sensor in low range aperture... ensuring a steady pressure is applied to the fatmeter to ensure that the sensor head is fully in contact with the pad. Press the READ button, and hold until reading is stable, then release. Repeat readings until "Average Reading" is displayed.
- Now locate the sensor in high range aperture and repeat the procedure above.

Assuming that the readings agree with your previous checks, then you can proceed to take measurements on your daily product samples.

Failed Check Pad Test

What if Check Pad readings do not agree with the Fatmeter ? This means that something has changed from the last test. Possible areas for error include…
- New , or inexperienced operator carrying out the checks.
- Incorrect calibration setting chosen
- Sensor not properly located in aperture, thus not in contact with the pad.

If the checks using the check pad have been carried out correctly, then we must suspect that the calibration in the Fatmeter has somehow changed.

There are THREE options at this point…
- Carry out a check in Iso-Propanol Solutions, and verify that the fatmeter results agree with Calibration Table supplied on the rear of your calibration certificate..
- If this check is OK, then the pad itself must be faulty. WE WOULD EMPHASISE THAT A FAULTY CHECK PAD IS RARE.
- If this check confirms that the fatmeter is 'out of calibration', then please contact Distell, to arrange for the fatmeter to be returned for service and re-calibration.

Contact Distell's Helpline for advice. We will talk you through the check procedure, and advise accordingly.

Satisfactory Check Pad Test - Measurement of Product Samples

Having ensured that the Fatmeter is operating correctly you can now proceed to the measurement of product samples…

It is extremely important to follow the instructions on the Wall Chart supplied for the product you intend sampling. Here is a quick check routine…
- You have chosen the correct product calibration.
- You have checked to ensure that the product is indeed a natural meat product, free of additives and other additions.
- Select 300 gms of minced meat product.
- For best accuracy the grind size should be between 3-8 mm and the product homogeneous and uniform.
- Product temperature should be between 0 – 10°C, with no ice crystals present in the sample.

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Satisfactory Check Pad Test - Measurement of Product Samples, continued

- Ensure that the sample has no air cavities within the sample by hand pressing the sample into a "patty" or "sausage" shape.
- Ensure that the sensor is placed firmly against the product, thus ensuring that there are no air pockets between the sensor and the product.
- It is normal to experience great variability in the individual readings. The coarser the sample, the greater the variability…an important check for product uniformity.
- EIGHT readings should be taken around the sample. The object is to try and obtain readings that are truly representative of ALL of the sample. This will ensure the greatest accuracy. The AVERAGE result displayed by the fatmeter is representative of ALL 300 gms of that sample.
- The data is automatically stored in memory for later downloading to PC via Software supplied by Distell.

Preparation of product samples for sending to laboratory
It is important that ALL 300 gms is packaged and sent to the laboratory for the analysis. The sample should be stored in a sealed polythene bag immediately after measurement. This will avoid dehydration and drip loss from the product sample.

Here is a quick checklist for the laboratory
- All 300 gms should be received at the lab, properly packed and sealed.
- All 300 gms should be blended, ensuring that any drippage is included in the blended sample
- The sample should be blended to create as homogenous a sample as possible.
- The lab personnel MUST take THREE samples of product from different parts of the blend for the chemical analysis. This will illustrate the homogeneity obtained by the blending process.
- The average of the laboratory triplicate analysis should be compared with the triplicate readings taken using the Meter.
- They should compare favourably to accuracy claims in Handbook.

If the results do not compare favourably check Meter use as follows…
- Has the correct calibration been used on the Meter
- Has the Fatmeter been checked on the Check Pad
- Is the operator proficient in the use of the Meter
- Is the product sample truly within the specification of the Meter calibration being used
- Check the product for uniformity, grind size and preparation

Check Laboratory Procedure
- Analytical method being used
- Sample preparation is OK
- Three samples, from different parts of the original 300 gms blend have been analysed

In conclusion
This is just a short check list on how to use and compare the Fatmeter with other methods.
Remember that the primary purpose of using the Fatmeter is to screen a lot of product for uniformity and specification. During the production process, finite accuracy is not the objective…the object is to try and ensure that the bulk of the day's production is within specifications time after time.

If, after these checks there is still a significant difference, please contact Distell for advice and help.

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Data Management & Download to Computer

The Fatmeter can download the measurements in "Real Time", or, as "Historical Data".

Data in 'Real Time'

Each time an average reading" is generated, after a series of readings, the meter downloads the data collected via the Download / Charging Socket.   If you wish to collect the data in real time, simply connect the data cable to the meter, and connect to your PC.   The data can either be collected using our standard software, or can be directly input to third party software (contact Distell for details in setting up).

Historic Data

Up to 1,000 sets of readings can be stored in memory.

Download using Data Management Software:

- **Standard:** Downloads the following data: Sample Reference, Time, Date, Calibration, Individual readings,

   Average: The data is available in a spreadsheet format, and is saved as a text file in "comma delimited format (CSV)" for use with other spreadsheet programs.

Your Computer Hardware

Your computer should be IBM compatible, with the ability to run Windows.

The Fatmeter comes complete with a Data Cable for connection to a communications port on your computer.

Please note: Always use the data cable supplied by Distell.

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List of standard calibrations available, plus short names used in data management software.

The calibration names given in this table are used in our meat Fatmeters. To determine the correct calibration for your needs, first find the type of meat product in the left column then use the calibration that is based on the sample preparation that you are using.

Meat species	Calibration name	Sample preparation	Measurement method	Measurement Range for this calibration
Beef 100% Natural beef muscle calibration (A general calibration using... beef meat)	BEEF-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Beef 100% Natural beef muscle calibration (A general calibration using... beef meat)	BEEF-2	Homogenised, blended	Measurements directly on surface of meat sample	1 – 60%
Beef 100% Natural Beef muscle calibration (A specialist calibration using... Australian beef meat)	BEEF-3	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Beef 100% Natural beef muscle calibration (A general calibration using... beef meat, with limited range setting)	BEEF-4	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 10%
Beef MRM beef calibration + water calibration (A specialist calibration using... beef meat, recovered using Baader M/c + 8% added water)	BEEF-5	Mechanically recovered meat emulsion	Measurements directly on surface of meat sample	1 – 60%
Pork / Beef 100% Natural pork + beef muscle calibration (A general calibration, using... 50% Pork meat + 50% Beef meat)	PORK / BEEF-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Pork / Beef 100% Natural pork muscle + beef muscle calibration (A general calibration using... 70% Pork meat + 30% Beef meat)	PORK / BEEF-2	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Pork 100% Natural pork muscle calibration (A general calibration using... 100% pork meat)	PORK-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 80%
Pork Bellies 100% Natural pork bellies calibration (A general calibration using... 100% pork bellies)	PORK-2	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 80%
Pork 100% Natural pork muscle + additives calibration (A specialist calibration using ... pork meat + additives)	PORK-3	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 80%
Pork 100% Natural pork muscle + 10% water calibration (A Specialist calibration using... pork meat + 10% added water)	PORK-4	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 80%
Pork Trims 100% Natural pork meat calibration (A general calibration using... pork trims from various pig types)	PORK-5	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 80%
Chicken 100% Natural chicken muscle calibration (A general calibration using... chicken meat from various chicken types)	CHICKEN-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Chicken MRM chicken muscle calibration (A general calibration using... chicken meat, mechanically recovered using... Baader M/c)	CHICKEN-2	Mechanically deboned, homogenised, blended	Measurements directly on surface of meat sample	1 – 50%
Chicken MRM Lean Chicken (A specialist calibration using... lean chicken meat, mechanically recovered using ... Baader M/c)	CHICKEN-3	Mechanically recovered meat using Baader M/c	Measurements directly on surface of meat sample	1 – 50%
Chicken 100% Natural chicken muscle + 10% Water (A specialist calibration using... chicken meat, mechanically recovered using... Baader M/c + 10% added water)	CHICKEN-4	Mechanically deboned, homogenised, blended	Measurements directly on surface of meat sample	1 – 50%
Horse / Pony 100% Natural pony / horse muscle calibration (A general calibration using... Icelandic horse meat)	HORSE-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Lamb 100% Natural Lamb muscle calibration (A general calibration using... various types of lamb meat)	LAMB-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%

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List of standard calibrations available *continued...*

Meat species	Calibration name	Sample preparation	Measurement method	Measurement Range for this calibration
Deer 100% Natural deer / venison muscle calibration (A general calibration using... various types of venison meat)	VENISON-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Reindeer 100% Natural reindeer muscle calibration (A general calibration using... various types of reindeer meat)	REINDEER-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Beefburger A general beefburger calibration (100% Natural Beef + 5% additives... salts, spices, onion, fillers, binding agents)	BURGER-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Hamburger A general hamburger calibration (100 % Natural Beef + 12.5% additives... salts, spices, onion, egg, other fillers, binding agents)	BURGER-2	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Smoked Ham Natural pork muscle calibration, cured and smoked (Specialist calibration)	HAM-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 40%
Luncheon Meat (A specialist calibration)	LUNCHEON-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 30%
Beef Sausage (A general calibration using... beef meat + additives from various manufacturers)	SAUSAGE-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Pork Sausage (A general calibration using... pork meat + additives from various manufacturers)	SAUSAGE-2	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%
Lamb Sausage (A general calibration using... lamb meat + additives from various manufacturers)	SAUSAGE-3	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Icelandic Sausage (A specialist calibration using... Icelandic meat + additives from ONE manufacturer)	SAUSAGE-4	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 50%
Salami (A specialist calibration using...Salami meat from ONE manufacturer)	SALAMI-1	Mince grind 3-8 mm	Measurements directly on surface of meat sample	1 – 60%

Please Note
- Natural calibration: Natural meat muscle, straight from the animal, with NO additives.
- Specialist calibration: Produced from ONE Meat Processor's manufactured product, including standard additives.
- General calibration: Produced from averaged results of manufactured product from more than one manufacturer / processor.

In order to obtain accurate results, it is recommended that a 250 - 300g sample is used. Eight readings are taken from around the sample and the meter will then display the average fat content, representing the entire sample. See sample measurement charts, available on our website, or from Distell.com.

Measurement Methodology & Terms Directly on meat
Measurements should be taken by placing the meter directly in contact with the surface of:
- A piece of whole meat or…
- A sample of meat product that has been minced or ground (recommended 3 – 8 mm grind)

Through the Skin
Measurements should be taken by placing the meter directly in contact with the surface of:
- (1) Sausage skin (usually a collagen based skin).
- (2) The skin of small animals, e.g. Chicken, Rabbit, etc.

Please Note
Use of the Fatmeter to take measurements through the skin of large animals, such as Cattle, is not recommended, mainly due to the thickness of subcutaneous fat layer under the skin. This fat layer prevents optimum penetration of transmission measurement into the muscle flesh of the animal, affecting the accuracy of measurement of the fat content contained in the underlying muscle of the animal.

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Meat Fat Meter MODEL MFM-1092

Notes;

Technical Specifications

Sensor Head:	Microwave Frequency:	1.975 GHz (+/-20 MHz)
	Microwave Power:	approx. 1 mW
	Dimensions:	80 x 25 x 10mm
	Materials:	Stainless Steel, PTFE
Sensor Enclosure:	Dimensions :	195 x 100 x 40mm
	Weight (inc. batteries)	725 gms
	Material:	ABS plastic Waterproofed to IP65
Display:	LCD, 2 lines x 12 characters	
Microprocessor:	Operations controlled by menu driven software.	
	Up to 80 calibrations can be programmed into the meter	
Batteries:	Internal, Nickel Metal Hydride (NiMh)	
Charger:	Universal Charger & Power Supply	

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Old Levenseat
Fauldhouse,
West Lothian, EH47 9AD
Scotland UK