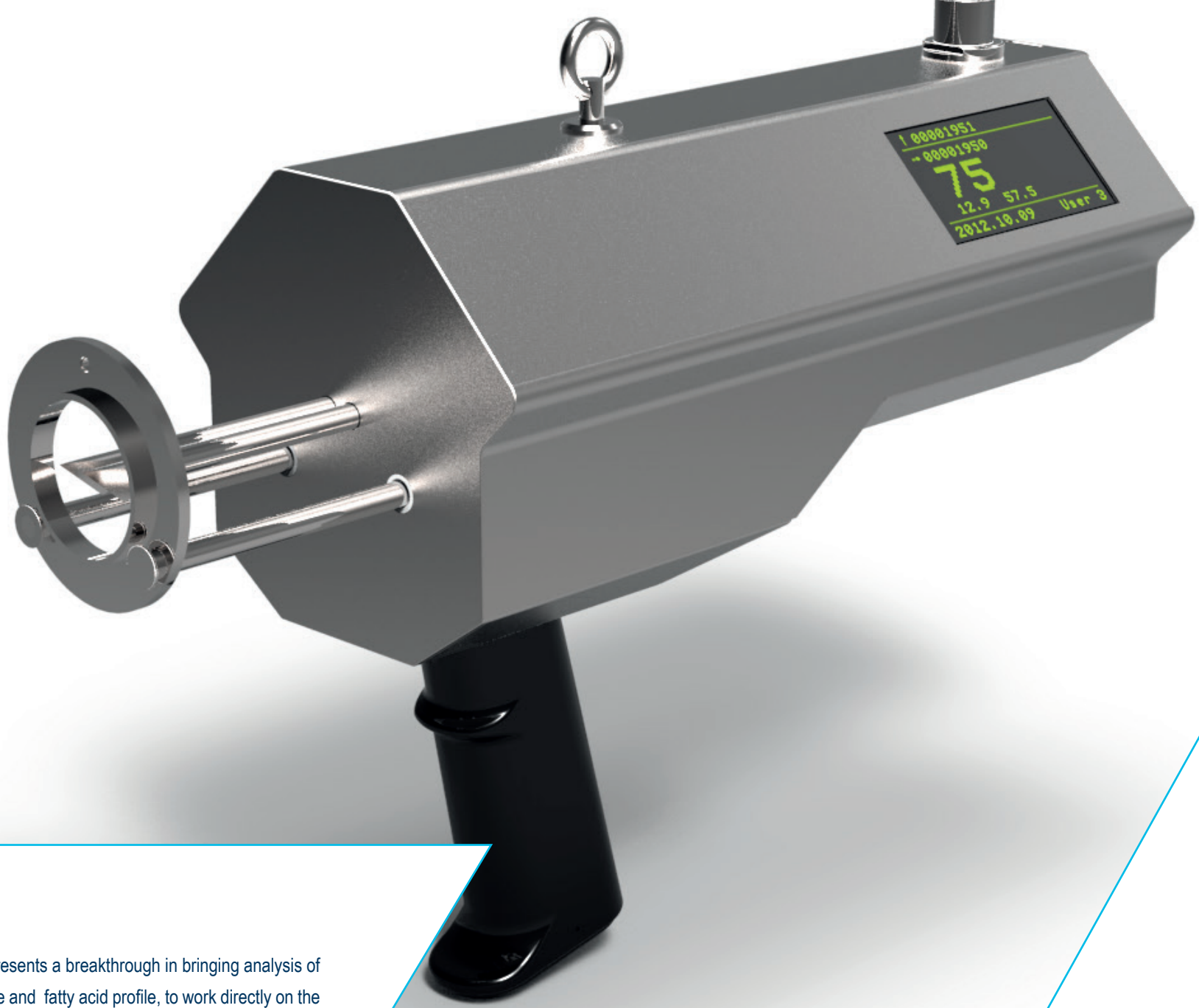
FRONTMATEC

Rapid online assessment of pork fat quality

NitFom™



Features include

The NitFom™ from Frontmatec represents a breakthrough in bringing analysis of fat quality traits, such as iodine value and fatty acid profile, to work directly on the kill floor at line speeds up to 1,350 per hour.

Online management of fat quality in your production

Reliable process analytical tool

The NitFom™ can provide online iodine value (IV) at line speeds up to 1,350 carcasses per hour. The NitFom™ is provided with a default IV model either for hot or cold carcasses based on Danish genetics and feeding regime.

As the NitFom™ calibration procedure is easy and robust, it brings a very reliable Process Analytical Tool to manage and control fat quality onto the production floor either in hot carcasses or cold carcasses.

Feedback on feed regime

The NitFom™ allows the slaughterhouse to manage and control fat quality in relation to all aspects of pork production. The instrument provides slaughterhouses with a valuable tool for an intelligent feedback system to producers on feeding regimes. Iodine value and fatty acid composition are largely the results of the feeding regime used to bring the animal to slaughter weight, but factors such as gender, weight and age do have an impact. By measuring up to 100% of the carcasses, it allows for an intelligent optimization for both slaughterhouse and producer.

Cut-floor optimization

The NitFom™ provides the opportunity to pre-sort carcasses for optimal cutting recipes by using iodine value or fatty acids as a sorting parameter. An example could be a “bin-sorting” style of approach to bacon products on the basis of the iodine value of the carcass.

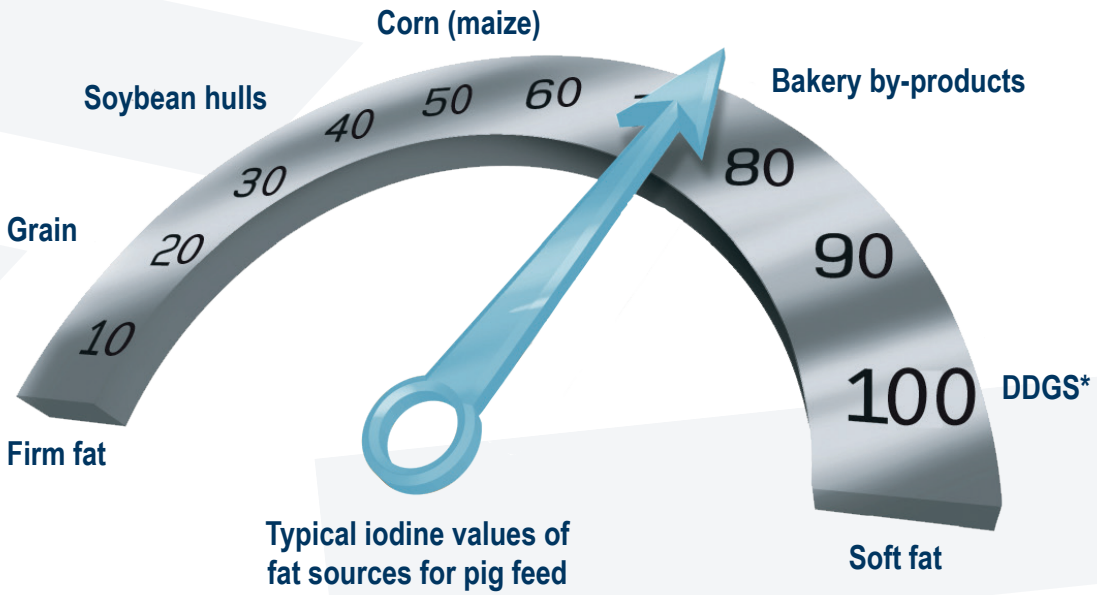
Instrument accuracy

The Danish IV models have high precision, with an accuracy of RMSEP=1.5 IV (hot) and RMSEP=2.0 (cold). Using the Danish model globally results generally in an RMSEP=3.5 IV (hot). Due to local differences in fatty acid composition of pigs it is generally recommended to perform local calibrations for individual fatty acids.

The theory behind

Pig fat tissue consists primarily of four fatty acids: the two saturated fatty acids stearic acid (C18:0) and palmitic acid (C16:0) and the two polyunsaturated fatty acids linoleic acid (C18:2) and α-linolenic acid (C18:3). It has been known for a long time that the softness of pig fat is correlated to the concentration of linoleic (C18:2) and α-linolenic (C18:3) acid, and inversely that the hardness correlates with concentrations of stearic (C18:0) and palmitic (C16:0) acids. Fat with a high iodine value results in poorer technological quality.

The NitFom™ uses Near-Infrared-Transmission (NIT) spectroscopy in combination with highly advanced chemometric modeling. The ultra fast measurements in combination with depth resolved spectra provides for a normalization of results giving very precise and robust measurements.



*Distiller's dried grains with solubles

Highlights

- The world's first online instrument for grading iodine value and fatty acids
- The NitFom™ makes sorting of and payment for carcasses possible through 100% testing
- Iodine value in real-time with a precision of 1.5 iodine values in hot carcass classification and 2.0 iodine values in cold carcass classification
- Can determine concentration of fatty acids in real-time
- Measurement cycle: 2.5 seconds
- Robust and reliable equipment designed for the kill floor
- "Easy-to-use" calibration and low operating costs

Picture: Iodine value and depth profile displayed in real-time at the Frontmatec Touch Panel i15

Technical data

Probe

Dimensions (HxWxD)	35x20x15 cm (12x8x6")
Measurement speed	2.5 sec. cycle
Line speed	Up to 1,350 carcasses per hour
Measurement depth	30 mm (1.18")
Supply voltage	110 or 240VAC
Probe interface	RS-485
Results	Iodine value, fatty acid profile
Power up time	2 hours
Temperature (The probe sensor only tolerates 45°C (113°F))	0-45°C (32-113°F)
Power consumption	175W
Diagnostics supervisors	Watchdog timer, temperature, supply voltage
Power down	Between measurements
Ingress protection	IP64
Weight	6 kg incl. cable

Technical data may be subject to changes

Terminal

Dimensions (HxWxD)	40x53x13 cm (16x21x5")
Screen size	15"
Touch	Projected Capacitive Touch (PCT)
CPU	Intel® Atom™
CPU speed	1.6 GHz Hyper-Threading or higher
Ingress protection	IP69K
Operating temperature	0-45°C (32-113°F)
Supply voltage	100/240VAC
Data ports	ID, results, log printer, Ethernet
Weight	18 kg (39 lbs)

Technical data may be subject to changes

Local model statistics - Danish pigs

HOT CARCASSES		R2cv	RMSECV
Iodine value	Standard	0.94	1.8 IV
Omega 6	Optional	0.91	1.2%
Omega 3	Optional	0.73	0.4%
Polyunsaturated fatty acids	Optional	0.94	1.2%
Monounsaturated fatty acids	Optional	0.56	1.5%
Saturated fatty acids	Optional	0.82	1.5%
C18:3	Optional	0.73	0.3%
C18:2	Optional	0.92	1.1%
C18:1	Optional	0.46	1.4%
C18:0	Optional	0.66	1.0%
C16:0	Optional	0.81	0.8%

*Using the local Danish model globally results in an RMSEP around 3.5IV for hot carcasses

COLD CARCASSES		R2cv	RMSECV
Iodine value	Standard	0.93	1.8 IV
Fatty acids	Future	-	-

Technical data may be subject to changes

Mechanical stand

Dimensions (HxWxD)	120x80x25 cm (47x23x10")
Power supply	110 or 240VAC
Mounting	Wall mounted

Technical data may be subject to changes

RMSEP
1.5 IV*
11%
0.5%
1.3%
2.1%
1.4%
0.3%
1.1%
1.7%
1.1%
0.7%

RMSEP
2.0 IV
-

Development

The NitFom has been developed in co-operation with the Danish National Advanced Technology Foundation and the University of Copenhagen (Faculty of Science, Department of Food Science).

The Danish National Advanced Technology Foundation

UNIVERSITY OF COPENHAGEN

Tried and tested

The Touch Panel i15 has been tested and approved by an independent, accredited third party test facility (DELTA) as per EN60529 (IP69K) for water and dustproof capabilities, and for its EMC compliance under EN61326-1:2001, as well as for the FCC compliance part 15, subpart B, class A.

DELTA CE FC

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Frontmatec develops world-leading customized solutions for automation in the food industry, other hygiene sensitive industries and the utilities industry. We are especially renowned for our high-quality systems for the entire value chain of the meat industry – from carcass grading, slaughter lines, cutting and deboning lines, hygiene systems and control systems, to logistics and packaging.

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