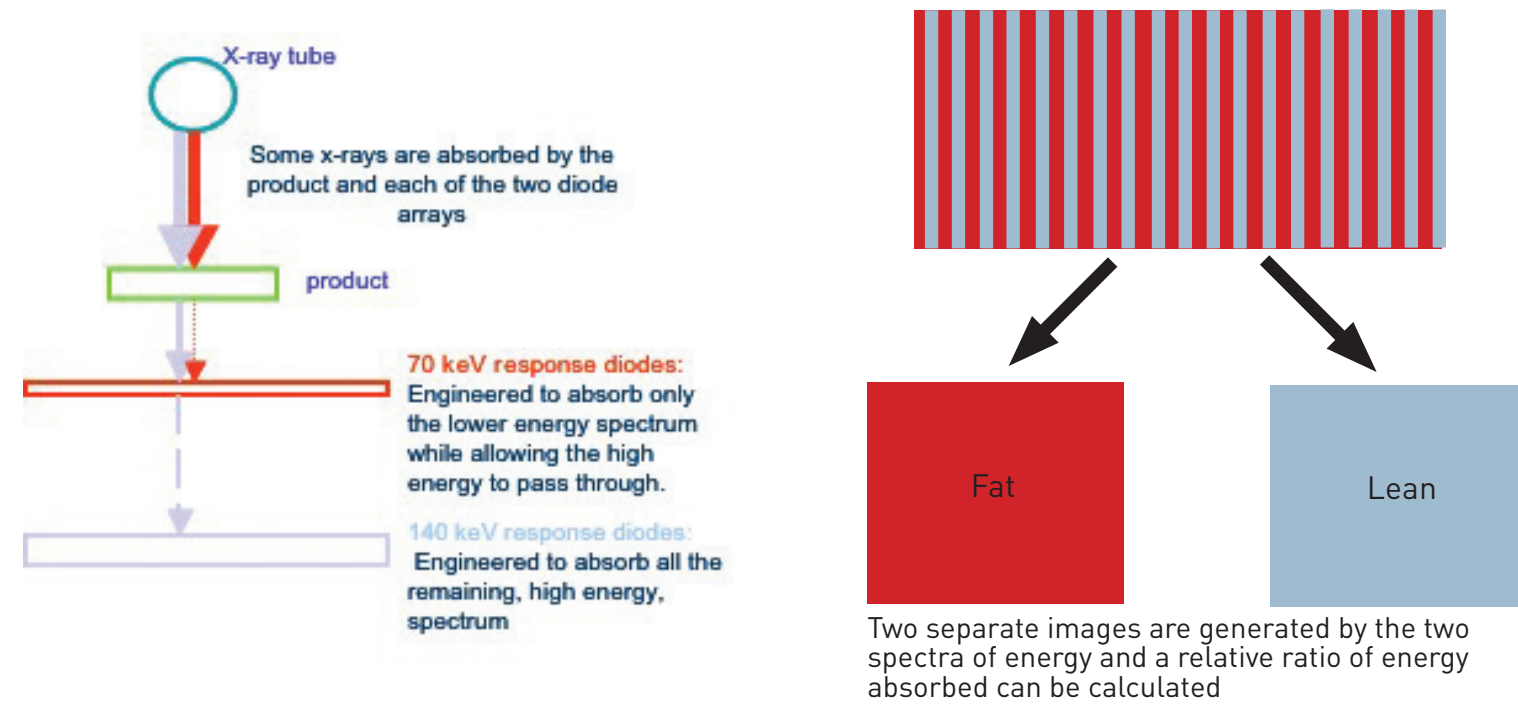


Eagle™ Fat Analysis - How it works...

Smiths Detection's Eagle FA system works on the principles of DEXA technology. DEXA technology works by measuring the amount of x-rays that are absorbed by fat and lean through the use of two specific x-ray energies. By taking the ratio of energy absorbed at a high energy to the level of energy absorbed at a lower energy the result of this ratio can be used to infer the average atomic numbers of the material scanned.



Current Methods of Fat Analysis

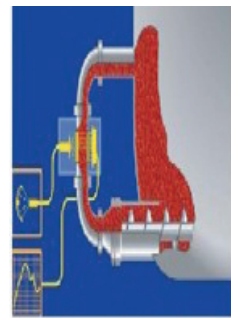
Fat Analysis is the process of determining the fat content in a given product. The industry standard method of fat analysis, Soxhlet, can be traced back to 1879. This method of testing is slow, invasive, expensive, and, without clinical control over sampling, is as reliable as the inaccuracy in the sampling method coupled with the inherent lab errors. Typical sampling error ranges from 2-4%, while lab errors can account for another 2%.

Currently, the most commonly used methods include:

- Anyl-ray is an offline measurement that uses x-ray to analyze the ratio of protein to water. This method works only on ground meat in a predetermined range of fat % and is known to have up to a 6% variance.
- NIR/NIT (near infrared reflection or near infrared transmission) is an inline measurement that uses NIR light to penetrate the surface tissue of the meat, with light reflected back to the detector. NIR/NIT has demonstrated a high degree of error in very lean and very fat samples.
- DEXA (dual energy x-ray absorptiometry) is an inline measurement that utilizes two energy spectrums to discriminate between high and low channel x-rays. This is the most accurate and repeatable method to date.



Soxhlet



NIR/NIT



Anyl-ray



DEXA

EAGLE™ BULK FA 720

The Eagle™ Bulk FA is a powerful on-line fat analyzer for meat products that can be utilized to provide real time feedback to your process. Whether batch or continuous processing, the system can provide CL data to tightly control the final blend.

System Features include:

- AMI Sanitary Design
- Simultaneously provides fat analysis, foreign object detection and check weighing
- Line speeds of up to 120FPM [36MPM] with 20 inch [508mm] inspection bed
- Inspection capabilities of .5" [12.7mm] to 7 inches [178mm] in depth
- Self monitoring and self calibrating routine
- Tool less belt change
- Pork, Beef, Turkey, Lamb, and Buffalo applications will work with the Eagle FA systems

Improve the efficiency of your operations by:

- Verifying incoming/outgoing goods for correct CL, weight, and foreign object detection
- Reducing lean meat giveaways
- Increasing Fat claim revenue or decreasing Fat claim losses
- Increased lab efficiency and revenue by changing random lab analysis to focused lab verification
- Removing contaminants before blend - sparing damage to blending equipment - or ensure final blend is contaminant free

EAGLE™ FA 720

The Eagle™ FA 720 X-ray inspection system constantly monitors the fat content and weight of meat products (in carton or E2 crate) within +/-1CL accuracy, detects foreign objects and check weighs. This ultimate end-of-line system is not affected by closed packages, metal foil, moisture, or freeze/thaw state. Eagle FA 720 allows you to quickly verify incoming and outgoing meat is within specification with full traceability and to internally sort cartons for batch applications that call for accurate blended final product.



System features include:

- Inline testing of 27Kg/60lbs boxes at production speeds
- Inspects 100% of every carton within +/-1CL, foreign object inspection and checkweighing at 1.5%
- Line speeds up to 120 FPM [36.5MPM]
- FA system has an optional barcode reader that reads barcodes from each carton providing the ability to catalog each carton based on CL value
- Network-ready with full statistics package included
- Multiple inspection capabilities combined with Fat Analysis provides a fast return on investment (ROI).
- Main screen displays up to 4 reject banks with system capability to independently control individual reject mechanism.
- Screen shows throughput, total rejects, individual reject reason, CL%, and product profile



SIMUL-TASK™ SOFTWARE

Smiths Detection's own SimulTask software simultaneously inspects products for foreign objects, weight, CL value and multiple product defects and provides that data for use in cataloging product, custom batch formulating or reclaim.

- **CL Measurement** - The Eagle FA system inspects 100% of the throughput for CL value, providing you with an accurate CL measurement accuracy. What this means to you is "NO MORE FAT CLAIMS!" and "NO LEAN MEAT GIVEAWAY!" With speeds up to 120 FPM [36.5MPM], one Eagle FA system can inspect all of your incoming or outgoing product for the entire plant.
- **Contaminant Detection** - In addition to fat analysis, Eagle FA systems use Smiths Detection's proprietary Multi-Task software to analyze each carton for metal, glass, stone and bone contaminants. The FA systems are not affected by freeze/thaw state, box moisture, metal foil, or meat conductivity issues.
- **Checkweighing** - Since X-ray cross-section absorption in the high energy beam is proportional to weight, the system can check-weigh products to better than 1.5% dynamic accuracy and will check-weigh product independent of vibrations, air current, etc.

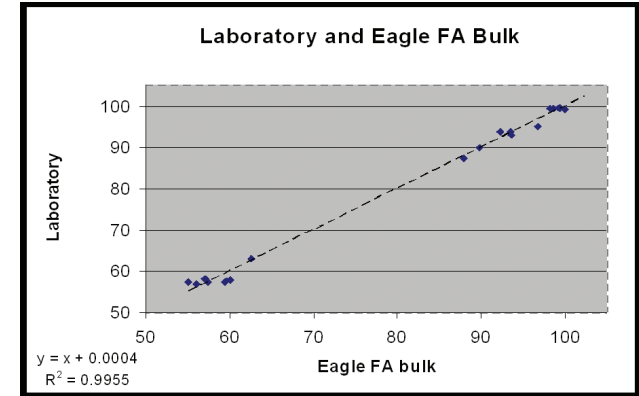
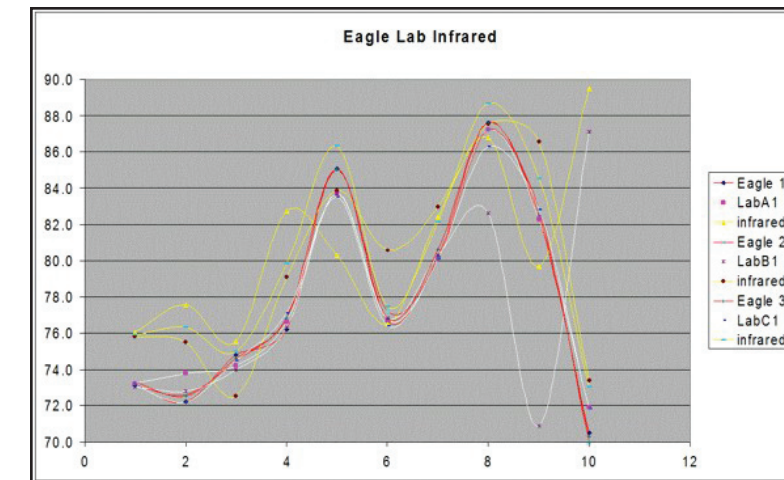
BARCODE READER

The Eagle FA 720 system reads barcodes from each carton providing the ability to catalog and sell each and every carton based on exact CL value, thereby eliminating lost revenue from underestimating lean meat content.

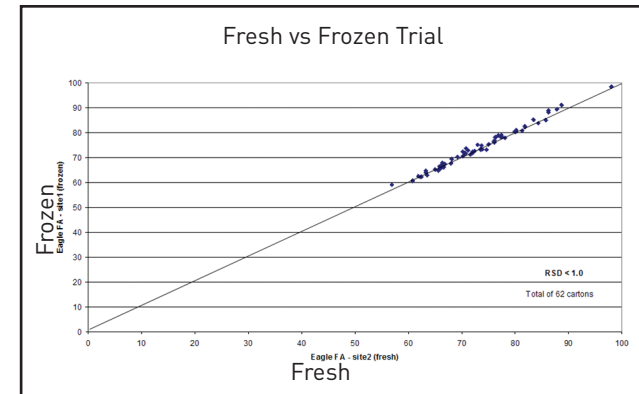
EAGLE TRACE SERVER

With the addition of Smiths Detection's Eagle Trace Server comes the ability to form a database of all products inspected, allowing you to build shipments to a specific CL value. The server package allows you to have real time data, and reports for production, rejection, weight, and trending. Also with the server you can network to a remote PC allowing Quality personnel to make informed decisions based on real time data.

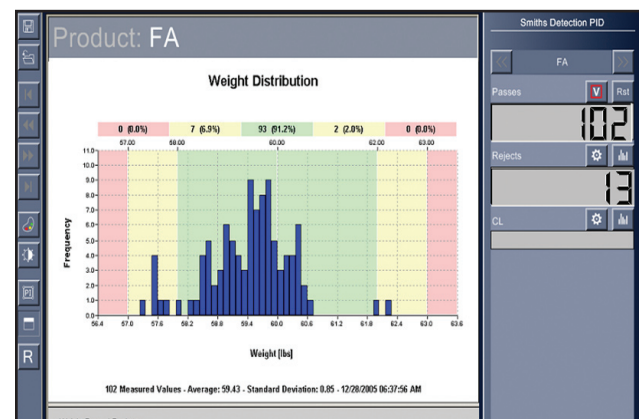
Eagle FA's +/-1 CL accuracy verified by 3 independent laboratories



The results confirm the ability of the Eagle FA and the bulk software to measure the CL of meat pieces, both individually and in combinations, (having a wide range of thickness distributions, average thickness, shape, weights and aspect ratios) with a precision of approximately +/-1CL.



Validation trial 2005: Results from scanning product on two different scanners in both fresh and frozen states demonstrated the irrelevance of thaw state in Eagle FA testing.



The weight statistics page is a helpful QA tool that can be utilized to reduce giveaways, and helps identify trends quickly.

Smiths Detection

As the world's leading manufacturer of X-ray inspection equipment, with over 40 years of continuous X-ray specialist development, Smiths Detection understands the importance of product quality. The Eagle line of X-ray product inspection systems were designed with reliability, versatility and ease of use firmly in mind; ensuring that you receive the highest quality, totally dependable inspection equipment you deserve and your customers demand. With over 35,000 X-ray systems installed globally, no competitor can even come close to our experience in automatic X-ray inspection.

End of Line Inspection

In order to remain successful in a highly competitive, and increasingly global market place, you must ensure that your products meet the quality standards your customers demand. There is significant cost associated with poor product quality. Before your products even reach the consumer you will need to meet the standards required by retailers and government agencies; we help you demonstrate that commitment to quality. In addition to immediate quality benefits, you will also realize that an Eagle™ system offers you much more in terms of added value – with highest cost/benefit ratio in the industry.

Fat Analysis

The Smiths Detection Eagle™ Fat Analysis systems analyze bulk meat or cartons of meat up to a 60lb (27kg) for chemical lean (CL) value within +/- 1CL.

The accuracy and repeatability of this measurement has been verified by an independent university study. Unlike traditional sampling methods, the Smiths Detection DEXA (dual energy x-ray absorptiometry) technology analyzes 100% of the meat in every carton. Cartons can also be tracked by bar code for easy batching and traceability.

In addition to analyzing the chemical lean value of the meat, the FA system check weighs and uses the SimulTask software to inspect for contaminants such as: metal, glass, stone, and calcified bone. The Smiths Detection product inspection line is not affected by freeze/thaw plant conditions, box moisture, metal foil or meat conductivity making the Eagle FA a perfect addition to your production line; systems available in carton and bulk configurations.



This 60lbs [27Kg] E2 Crate of raw frozen beef was inspected for CL value and foreign contaminants.



This SimulTask™ 4.0 image inspects the meat for foreign object contamination as well as CL value. The CL value of this raw trim meat (featured above) is 94.27%.

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Fat Analysis



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U.S. Patent No. 7,164,749 and 6,895,072 B2.

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