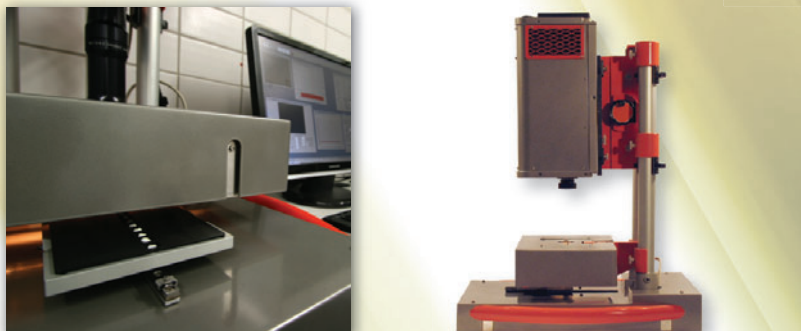


## Offline & Online Hyperspectral Cameras

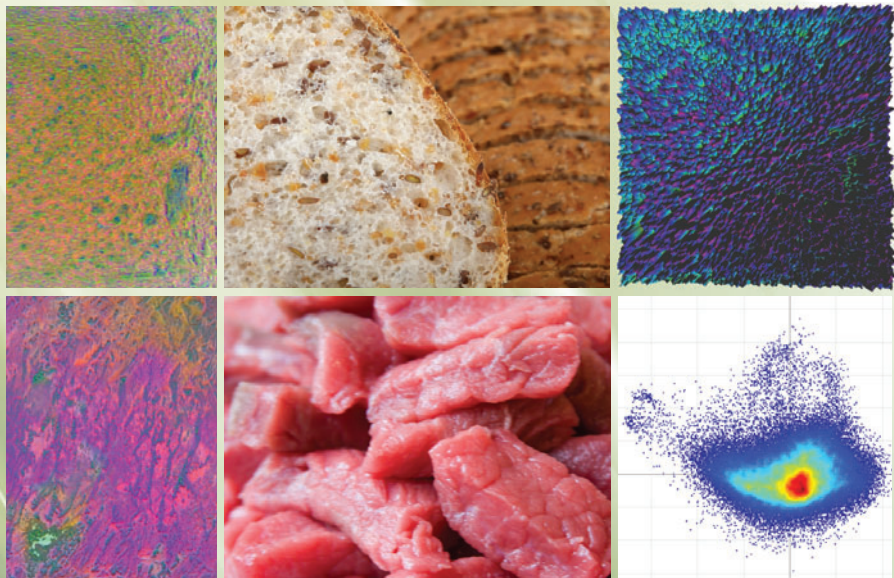
SisuCHEMA is a complete workstation for chemical imaging in the near-infrared region. Its push-broom technology provides a speedy measurement procedure, which facilitates the everyday quality control of pharmaceutical and food products. With fully exchangeable optics, SisuCHEMA is easily adjusted to the required field-of-view. The analysis procedure can be fully automated into routine applications using customized scripts. Furthermore, the hyperspectral camera unit along with created calibration models are readily transferable to on-line situations thanks to the used line-scan technology.



Picture 3. The SisuCHEMA workstation for hyperspectral imaging in the NIR region. The push-broom technology with exchangeable sample trays and optics provides a speedy measurement procedure.

## Hyperspectral Imaging Applications

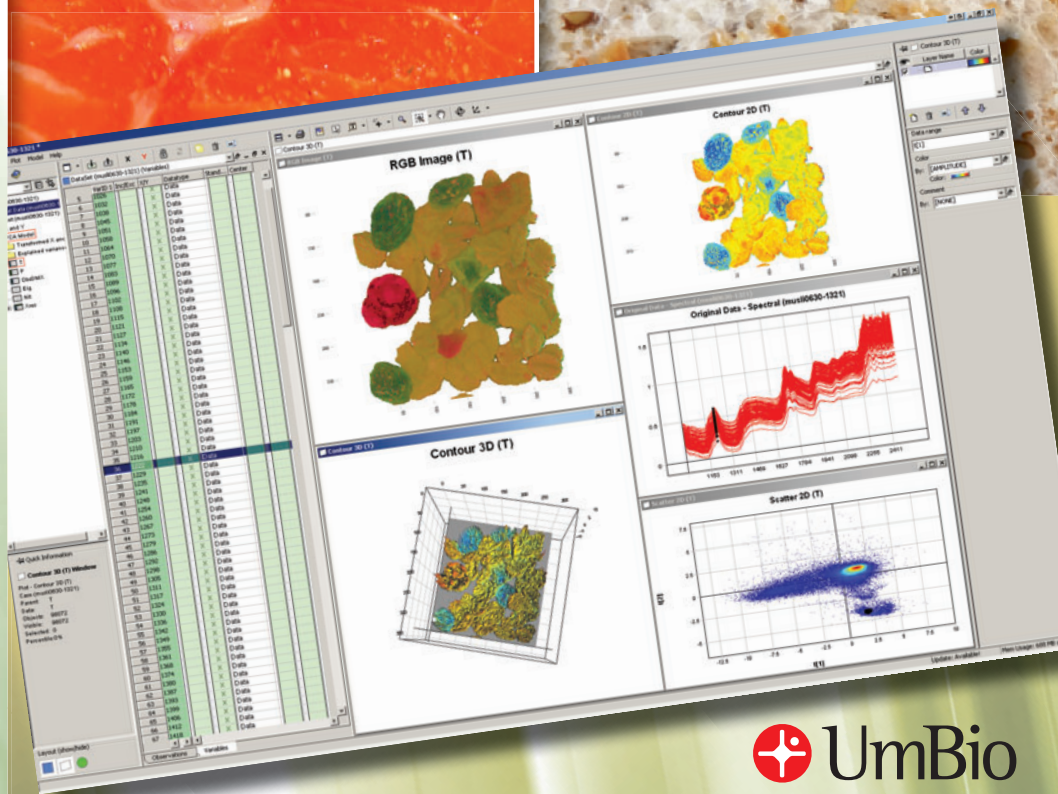
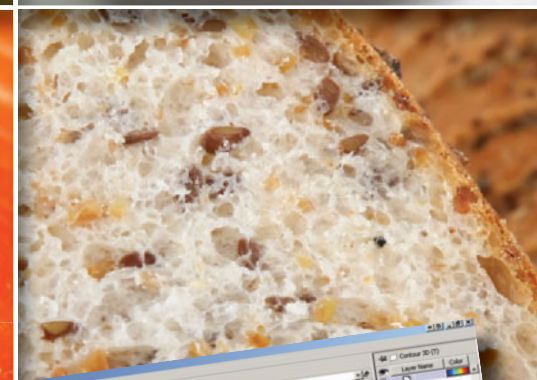
There is no limit to the number possible hyperspectral imaging applications within food and pharma production. Applications within food production include prediction of moisture content and dry matter, hardness, protein content and fat content to name a few. Applications within pharma production include assessment of API distribution, detection of coatings, tablet identification and contaminant detection.



Picture 4. Hyperspectral imaging applications within food and pharma production include moisture & protein determination in bread and meat quality control.

HYPERSPECTRAL CAMERAS  
PROVIDED BY PARTNER

## Hyperspectral Imaging for QA/QC in Food and Pharma applications



## Hyperspectral Imaging in Food & Pharma Applications

Hyperspectral Imaging is a powerful technique for characterising process material in a variety of applications present in food and pharma production. Both online and offline measurements are possible where a high-speed camera examines the material. A full hyperspectral image consisting of thousands of pixels with several hundreds of wavelengths are obtained just in a few seconds. Each individual spectra in the image can be seen as a fingerprint, giving detailed chemical information about the material.

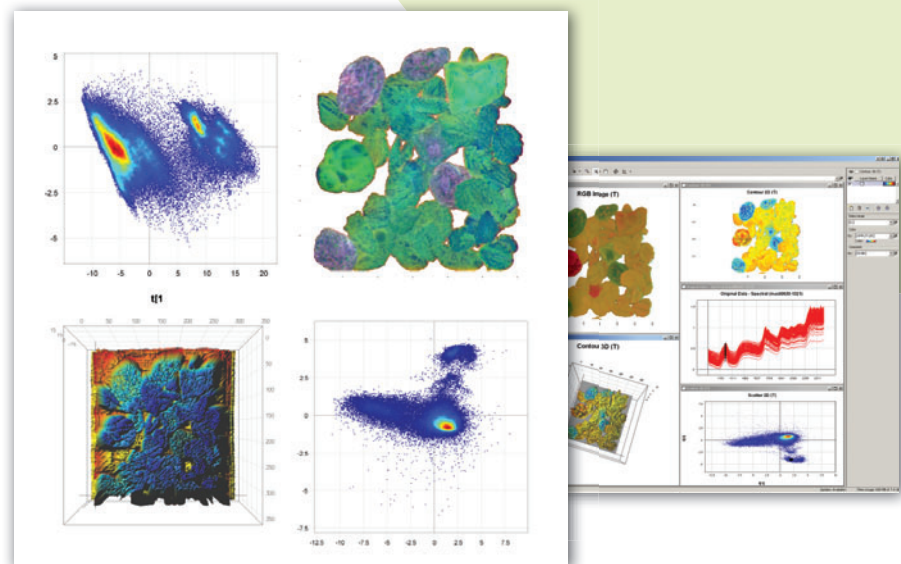


Picture 1. Hyperspectral Imaging can characterize a variety of process material in food and pharma production. Each measured pixel represents a full spectrum, which gives detailed chemical information about the material.

## Offline Hyperspectral Image Analysis

Evince Image is a software for exploration and modelling of hyperspectral image data. With efficient analysis techniques, the user can quickly extract relevant information from the image. Created calibration models are easily exported and saved for future use. A wide range of visualizations is available, both for raw and processed data. A visible interaction between data and graphics, as well as a streamlined workflow, makes the exploration fast and effective!

Image  
**Evince**



Picture 2. Evince Image provides efficient analysis and exploration of hyperspectral images. A wide range of visualizations enable the user to quickly extract relevant information.

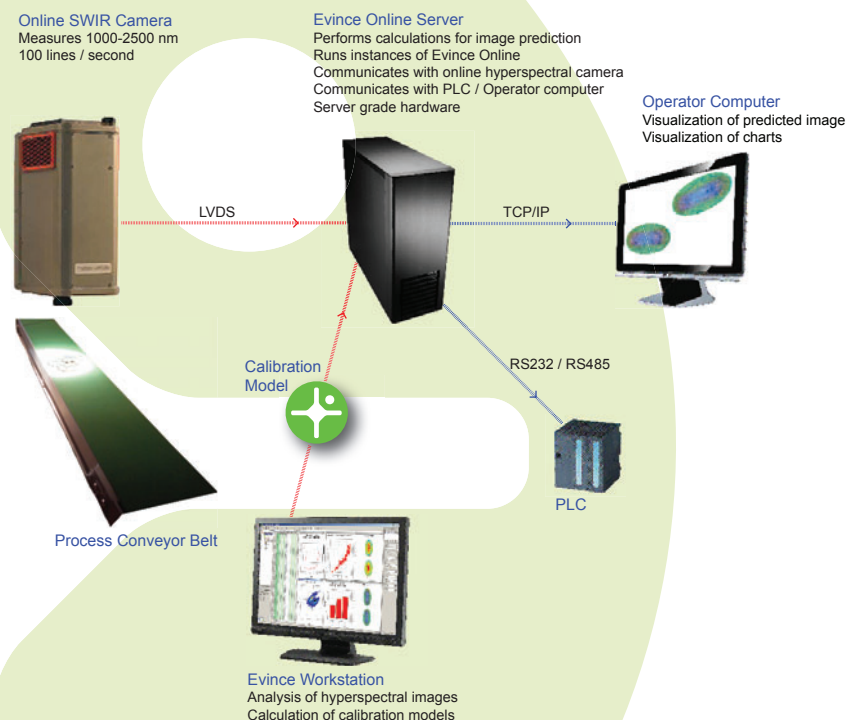
## Online Hyperspectral Process Control

UmBio  
**Evince**  
Online

Evince Online is a software for online predictions of spectroscopic data from hyperspectral line-scanning cameras. The prediction is based on multivariate image analysis using Principal Component Analysis (PCA) and Partial Least Squares regression (PLS).

Evince Online performs real-time automatic prediction of captured data using calibration models created in UmBio's software Evince. Each pixel of the captured line is translated to a property of the scanned material using the parameters given by the used calibration model. The results can be sent to a PLC controlling the process or to a computer showing process information to an operator.

### Evince Online Process Environment



### Typical Evince Online Workflow

