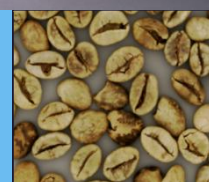
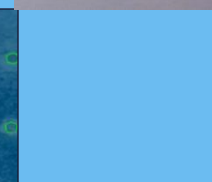
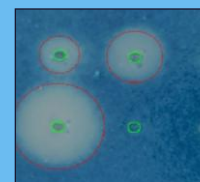


## Introduction to VideometerLab 2 for Malting

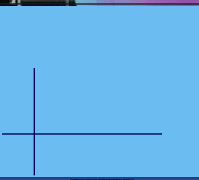
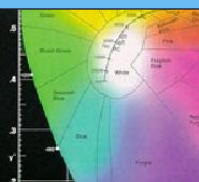


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## Information available throughout the process

- Incoming barley
  - ✓ *Fusarium*
- Steeping
  - ✓ hydration
- Germination
  - ✓ chitting
  - ✓ rootlets
  - ✓ acrospire
- Malting
  - ✓ *Fusarium*



Easy to use – no consumables - results within 10 seconds!



# *Fusarium* in barley

Barley selected for use in the malting industry must meet pre-defined quality specifications. The presence of *Fusarium* can be detected in barley prior to malting, and in finished malt.

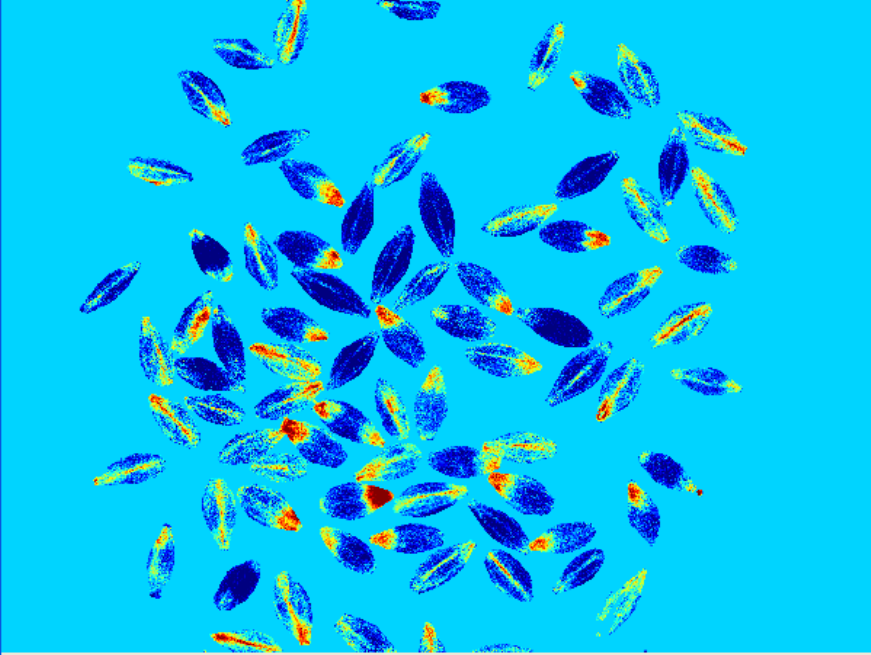


# Fusarium in barley - user interface

**Session:** barley fusarium 05112008 test

**Recipe:** barley fusarium 05112008 test

**Plan:** No Plan



Sample ID	Note	Area [%]
Test medium infected_1		15,0322971
Test medium infected_2		12,8757563
test medium infected		12,7840834
Medium infected_3		12,7898273
High infected_4		36,368618

Next Sample Data

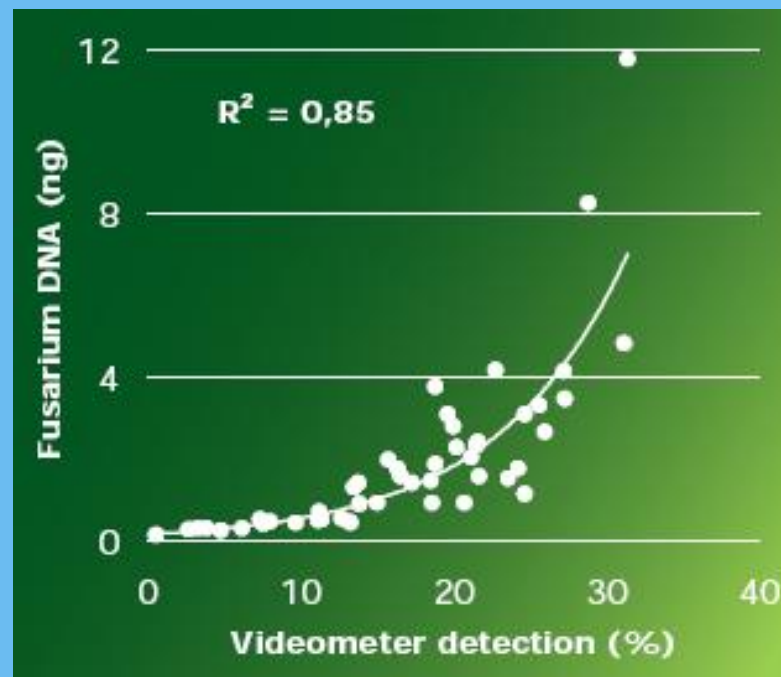
Sample ID:  Sample Note:

Auto Number:  Filename: barley fusarium 05112008 test\_High infected\_5



# Validation by Carlsberg Research Center

Comparison between VideometerLab measurements and the level of *Fusarium* DNA quantified by real-time PCR shows excellent correlation of  $r^2 = 0.85$



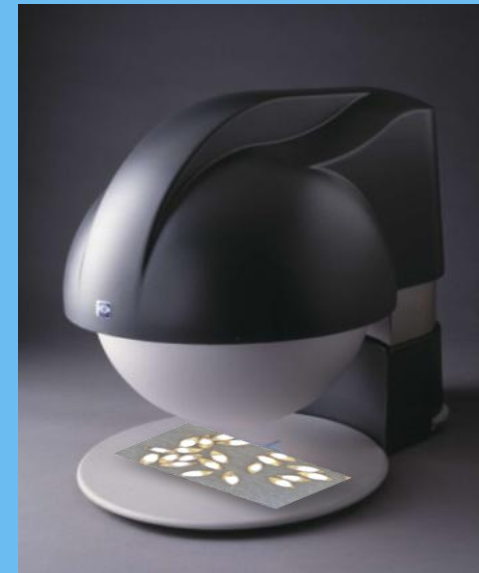
VideometerLab provides a simple method of measuring *Fusarium* in raw material and finished malt



# Steeping process - hydration

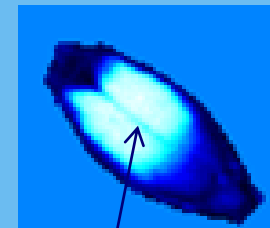
## Detection of non hydrated area – 4 simple steps:

1. Part the grains lengthwise
2. Place the grains with the inside up – on a dark plate
3. Insert the plate under the VideometerLab
4. Activate measurement



## Result within 10 seconds

- The degree of non hydrated area will be shown directly in a pseudo-color image (next slide)
- Calculated as the relative area of non hydrated kernel



Not hydrated

VideometerLab makes evaluation of hydration during the steeping process easy

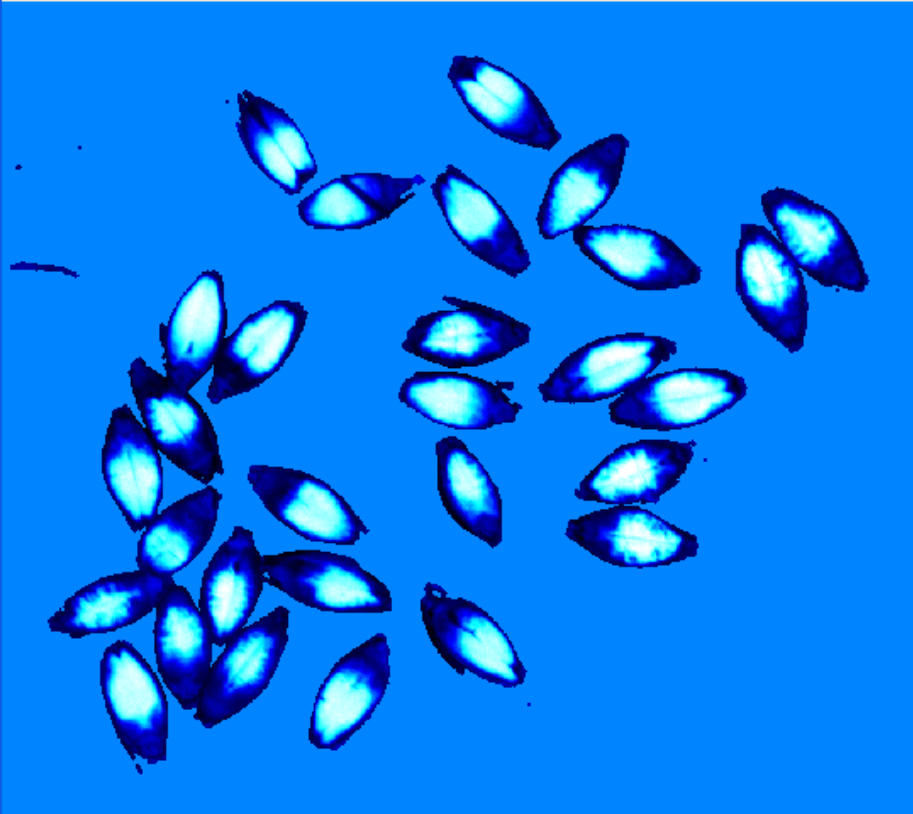


# Hydration – user interface

Session: hydration 2003

Recipe: hydration 2

Plan: No Plan



Sample ID	Note	Area [%]
hydration 2001_test_		38,0920677
hydration 2001_test_		38,4976044
hydration 2001_test_		37,7641
hydration 2002_test_		38,0161552



# Germination - introduction

VideometerLab can be used to measure the following steps in the germination process

- Chitting %
- Rootlets %
- Mean acrospire length

Results from the VideometerLab on each step are shown over the next few slides.



# Germination process - chitting

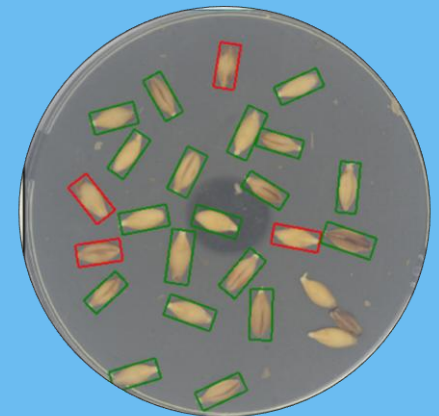
## Detection of chitting % – 3 simple steps

1. Put the grains in a petri dish (grains laying closely together will not be measured)
2. Place the petri dish in the VideometerLab
3. Activate measurement



## Result within 10 seconds

- Grains without any sprout will be marked in a red rectangle and grains with sprouts will be marked with a green rectangle in the output image (next slide)
- The number of chitted kernels in % will be calculated



VideometerLab makes it easy to follow chitting during the germination process and decide to add more water or change temperature



# Chitting – user interface

Session: Chitting001

Recipe: Chitting  
Plan: No Plan



Sample ID	Note	Total	Sprout	Sprout Perce
At desteeep1		21	8	38,0952377
At desteeep2b		19	2	10,5263157
At desteeep3		22	18	81,8181839
At desteeep4		23	19	82,608696

Start

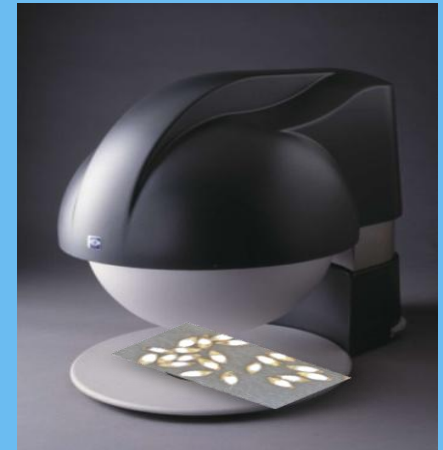
Finish Session



# Germination process – rootlets

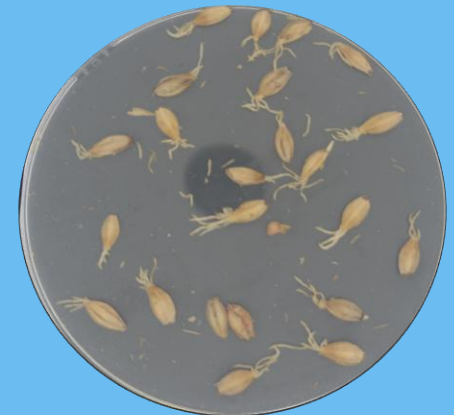
## Detection of % rootlets – 3 simple steps:

1. Put the grains in a petri dish
2. Place the petri dish in the VideometerLab
3. Activate measurement



## Result within 10 seconds

- Rootlets will be shown directly in a pseudo-color image as dark blue (next slide)
- Calculated as the relative area of rootlets compared to the area of rootlets and grain in %



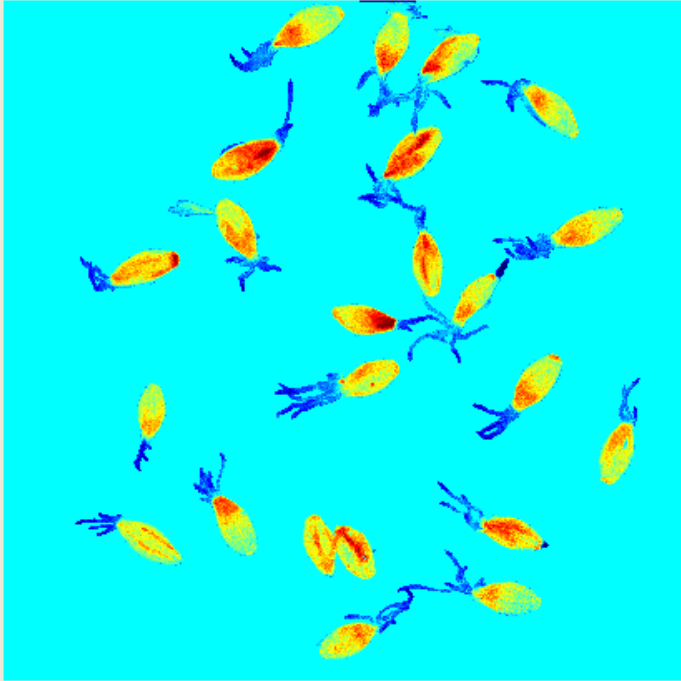
VideometerLab makes it easy to determine % rootlets during the germination process and decide to add more water or change temperature



# Rootlets – user interface

Session: Rootlets002

Recipe: Rootlets  
Plan: No Plan



Sample ID	Note	Area [%]	Area Avg. [%]
Germ day 1		13,4449425	13,4449425
Germ day 1 N		4,43945	4,43945
Germ day 2		20,8505344	20,8505344
Germ day 2 N		1,60815847	1,60815847
Germ day 3		19,854744	19,854744
Germ day 4		22,9921722	22,9921722

Start

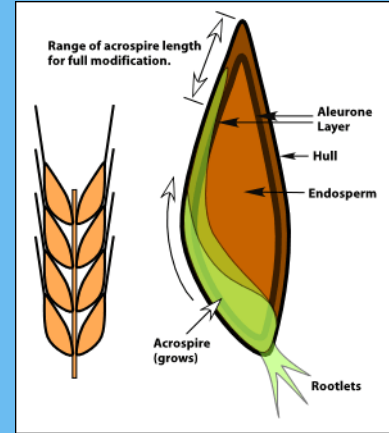
Finish Session



# Germination - acrospire length

The germination process can be followed by measuring the length of the acrospires inside the kernel

- Boil the germinated malt for 10 minutes and leave the kernels in the water for 30 minutes.
- Place 26 kernels in the presentation tray – with the front side up
- Insert the sample holder in the VideometerLab
- Activate measurement
- The acrospire model measures the length of the acrospire and compares it with the length of each seed



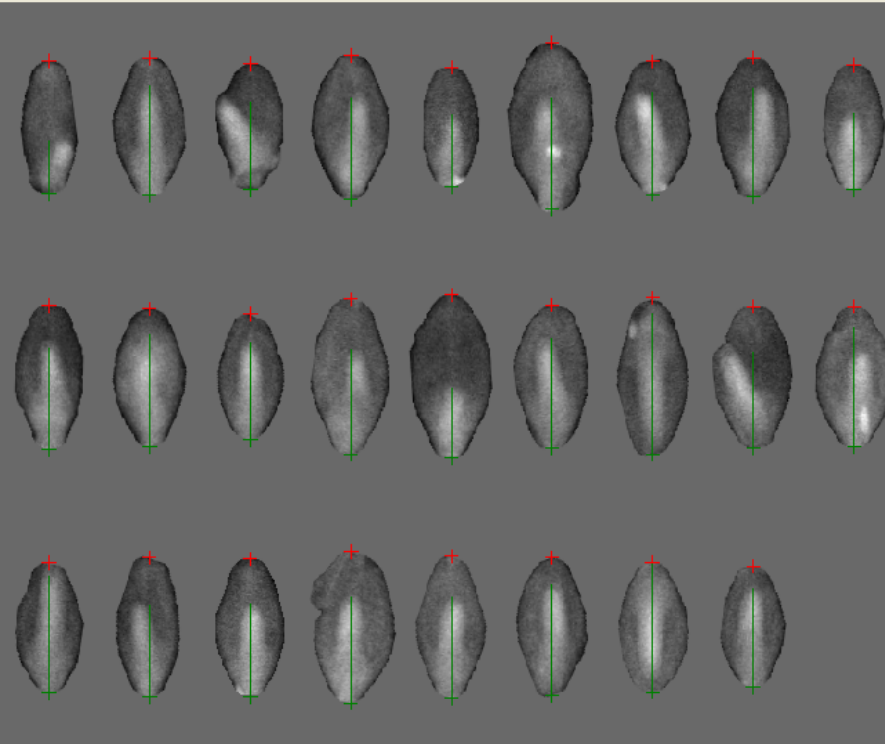
Results within 10 seconds

VideometerLab provides a fast and accurate way to calculate the mean acrospire length - and when to stop germination



# Acrospire length – user interface

Session: New Acrospire length bm 2003  
 Recipe: New Acrospire length bm 2  
 Plan: No Plan



Sample ID	Note	#Total	Mean Relativ	#Group1	#Group2	#Group3	#Group4	#Gro
Prove0_1		25	0.575	2	5	15	3	0
Prove0_2		26	0.5576923	0	10	13	3	0
Prove0_3		25	0.585	0	9	11	5	0
Prove0_4		26	0.6298077	0	7	13	5	1
Prove1_1		26	0.677884638	1	6	6	13	0
Prove1_2		26	0.7692308	0	0	11	15	0
Prove1_3		26	0.7355769	0	2	12	11	1
Prove2_0		26	0.7019231	0	1	16	9	0
Prove2_1		26	0.6923077	0	1	17	8	0
Prove2_2		26	0.721153855	0	3	10	13	0
Prove2_3		26	0.711538434	0	2	13	11	0
Prove2_4		26	0.7355769	0	2	12	11	1

Resume  
 Finish Sessio



# Germination – summary

Crucial information on the physical properties of barley kernels can be used to optimise germination; deciding when to add water and heat and when to stop the process. VideometerLab gives rapid and accurate data throughout the germination process.



# Routine use at the Danish Malting Group



VideometerLab 2 provides vital information for careful control of the malting process. At each stage the results are provided in seconds.

For more information contact Analytik (UK and Ireland distributor)

[www.analytik.co.uk](http://www.analytik.co.uk)

