

SOP No: SOP-PHYS-001	SOP Description: Foss GrainCheck™ for Head Rice Yield
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SOP-PHYS-001: Foss GrainCheck™ for Head Rice Yield

Scope:

Head Rice Yield (HRY) is the primary factor for determining rice milling quality. It is defined as the mass percentage of rough rice kernels that retain at least three-quarters of their original length after milling. To calculate this value gravimetrically, it is necessary to know the original rough rice weight. However, an automated system has been developed to determine HRY based on video images of the individual kernels after milling. This system is the Foss GrainCheck™ 2312.

Principle:

Milled rice kernels are fed into the machine on a conveyor belt, from which they are weighed and imaged by video camera. Parameters including kernel weight, weight percentage, count, dimensions, size distribution, and others are recorded from these images and analyzed via dedicated computer software. Results for whole and broken kernels are presented, which may be printed or saved for further analysis.

Equipment:

2312 GrainCheck™, FOSS TECATOR AB, Höganäs, Sweden

Materials:

Milled rice sample (50 g or more), aspirated to remove dust particles
Brushes for cleaning

Procedure:

1. To start the program, enter the following commands:
Local host login: "drift3" → password: "seedstart" → Local Domain Prompt: "seedstart". The program screen should appear.
2. Before running a sample, clean the belt by selecting Misc. → Quick Clean (click and drag). Dump the sample drawer after running the quick clean to empty out any debris removed from the belt.
 - a. Occasionally, debris will collect on the belt that is not removed during the quick clean step. If this occurs, use only a Q-tip and distilled water to spot clean. Otherwise, the belt should not require any cleaning, brushing, or other manipulation.
3. Check the balance inside the machine to make sure it is tared. To do this, open the door on the side of the machine and visually look at the balance at the back to see that the reading says "0.00". If it does not, press the "zero" button on the balance.
4. To run a sample, click on "Application" at the top of the screen. From the drop down menu, select "LGR TBK, FGIS" when testing long grain samples; for medium grain, select "MGR TBK, FGIS".
5. Press the "start/stop" button at the top of the screen, enter the sample name/number and hit "OK" to start the machine.

6. When the machine starts running, pour your sample into the sample port.
7. Wait for the sample to run. While the sample is running, make sure that all kernels move through the port to the belt inside the machine.
8. Record the weights (g) and percentages of the broken and whole kernels.
9. After each run, clean the belt using the quick clean function (Misc → Quick Clean). Also brush any kernels that collect on the silver plate above the sample drawer. Dump the sample drawer after quick clean.
10. To run the next sample, repeat steps 5-9.
11. To save the data file, select Misc → Export and Remove Files. In the pop-up menu, select “Source type” and choose “result files”. Choose either “long grain” or “medium grain,” and then choose the “date” from the file names that appear. Choose “export” and the files may be saved to a zip disk.
12. Shut down the program and computer properly:
 - a. Exit all programs.
 - b. Press <Ctrl><Alt><Delete> simultaneously, then at the prompt, type “halt” and press <Enter>.
 - c. If prompted for a password, type “foobar” and press <Enter>. Wait until the line “System halted” appears on the screen, then switch power off.

NOTE: If you would like to collect size/color distribution data, use the following procedure:

1. After logging in (step 1 above), go to the Settings menu on the tool bar.
2. Select Size/Color of Sample to record size and color data of the entire sample; select Size/Color of Main Fraction to record size and color data for the main fraction of the sample. Once either of these options is selected, a new button, “Size/Color”, will appear on the tool bar.
3. When the Size/Color button is selected, a new screen will appear with a list of size and color attributes available. When any attribute is selected, a histogram of the distribution for that attribute will appear. The distribution data is also organized in a table, including mean, standard deviation, coefficient of variation, and range for the particular sample.
 - a. Size distributions include: width, length, max distance, mean diameter, area, volume, roundness, convexity and width/length ratio.
 - b. Color distributions include: intensity, red, green, and blue.
4. To remove the “Size/Color” button from the toolbar, return to the Settings menu and select No Size/Color. The size and color distribution data will no longer be recorded.