WHEAT TEMPERING REVOLUTION

omas

Italian Excellence

OPTIMUM WHEAT TEMPERING

A proper wheat tempering is obtained when:

- **The flour moisture content is satisfy the market rules 13,5 - 15%**
- **We maximize the extraction of low ash flour from the wheat 78-80 % by reducing the bran pulverization to minimum**

TEMPERING FACTORS

The wheat tempering is a combination of 2 element :

- **H20 [kg/h]**
- **Time [h]**

TEMPERING WATER

The amount of tempering water to be added to the raw wheat is easily defined with the following calculation :

- **H20 tempering = (FL H20 + M loss – W H20) /100 x Q**

- W H20 = raw wheat moisture [%]
- FL H20 = flour moisture [%]
- M Loss = milling loss or evaporation during process [%]
- Q = amount of wheat in [Kg/h]

TEMPERING WATER

- W H20 = raw wheat moisture 12%
- FL H20 = flour moisture 14,5%
- M Loss = milling loss 2,5%
- Q = wheat 15.000 Kg/h (300Mt/24h)

- **H20 tempering**
- **(14,5 + 2,5 – 12) /100 x 10.000 = 750 Kg /h**

TEMPERING TIME

The total time required by the wheat to absorbed the H20 is subject to the following :

- **Wheat Type (physical characteristic)**

- Amount of Lignin and Cellulose that make bran layers
- Virtuosity of the starchy kernel
- Amount of protein
- Raw wheat initial Moisture

TEMPERING TIME

- Soft Wheat = **6 - 10 h**
- Medium Protein Wheat = **8 - 16 h**
- Hard Wheat = **15 - 25 h**
- Australian Hard Wheat = **24 - 36 h**

Average raw wheat moisture 11 - 12,5%
Australian Hard Wheat 8 - 10%

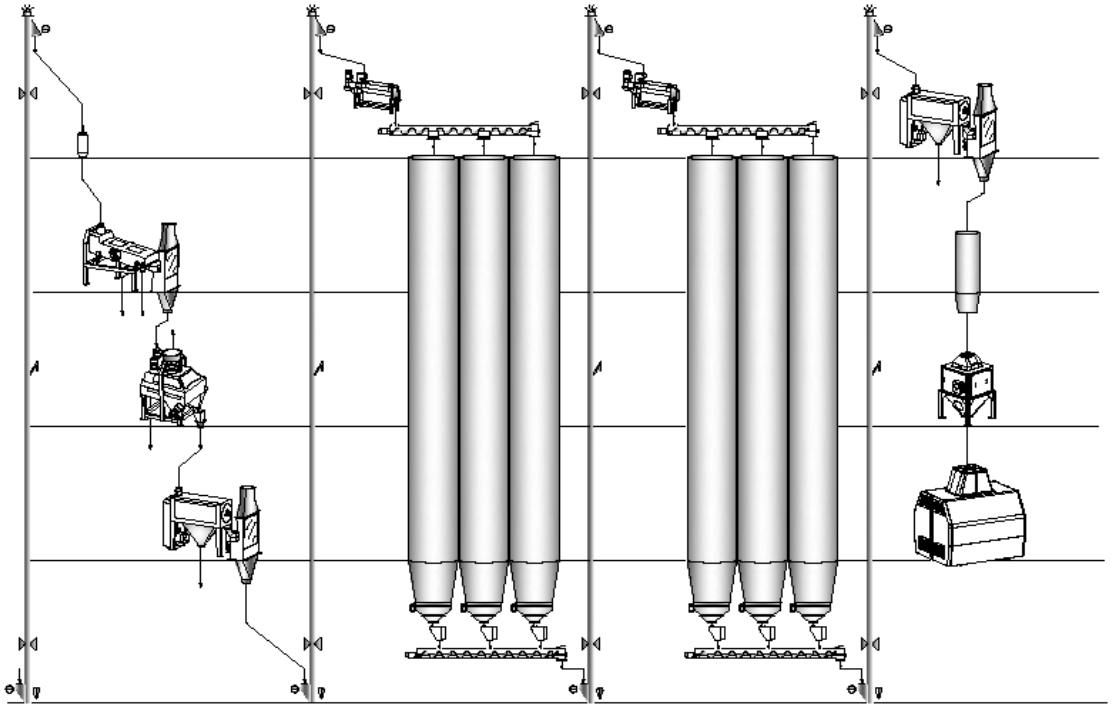
TEMPERING PARAMETER SETTING

Hard wheat 11-13% protein contents
Raw moisture 12 % H2O

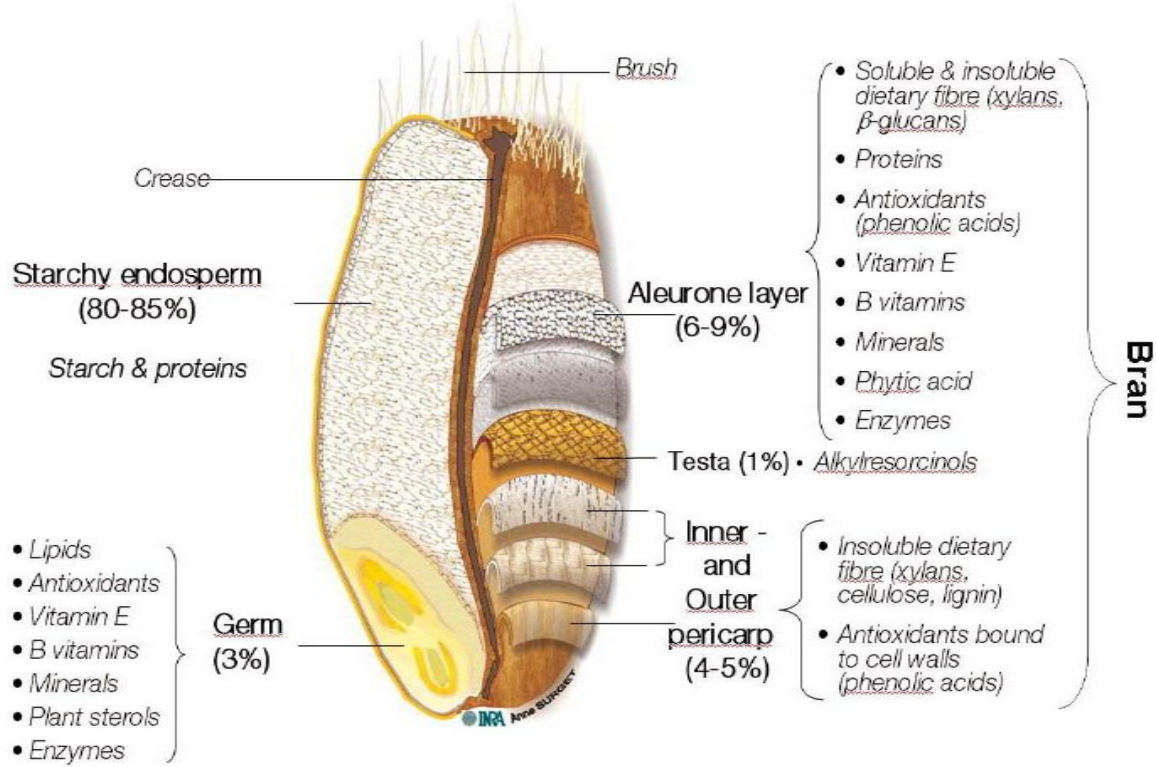
- 750 Kg/h H2O
- Resting time of 22 - 24 h

- **1st tempering 12 h and 50 % of H2O**
- **2nd tempering 12 h and 50 % of H2O**

STANDARD TEMPERING PROCESS



WHEAT KERNEL



WATER ROUTE

If pericarp is the most water proof protection envelop of the wheat to where is enter the tempering water ?

The highest amount of tempering water is absorbed trough **the germ** opening which is **less than 10 %** of the total kernel surface !!!

It is clear now the long time needed to be absorbed and the high moisture on the bran roller mill 2 BK-5 BK

OMAS TEMPERING REVOLUTION

By removing part of the external pericarp
We will remove the most **water proof layers**

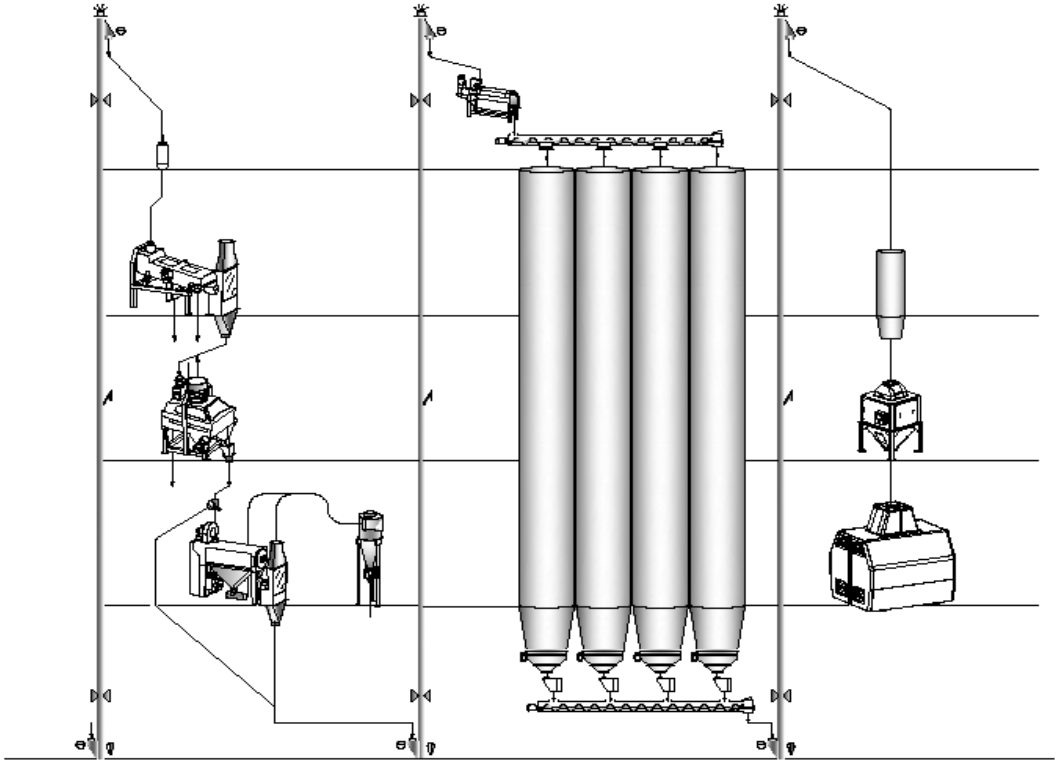
Therefore allow the water **to be absorbed by a wider surface** in a **shorter time**.

How can we obtained that ?

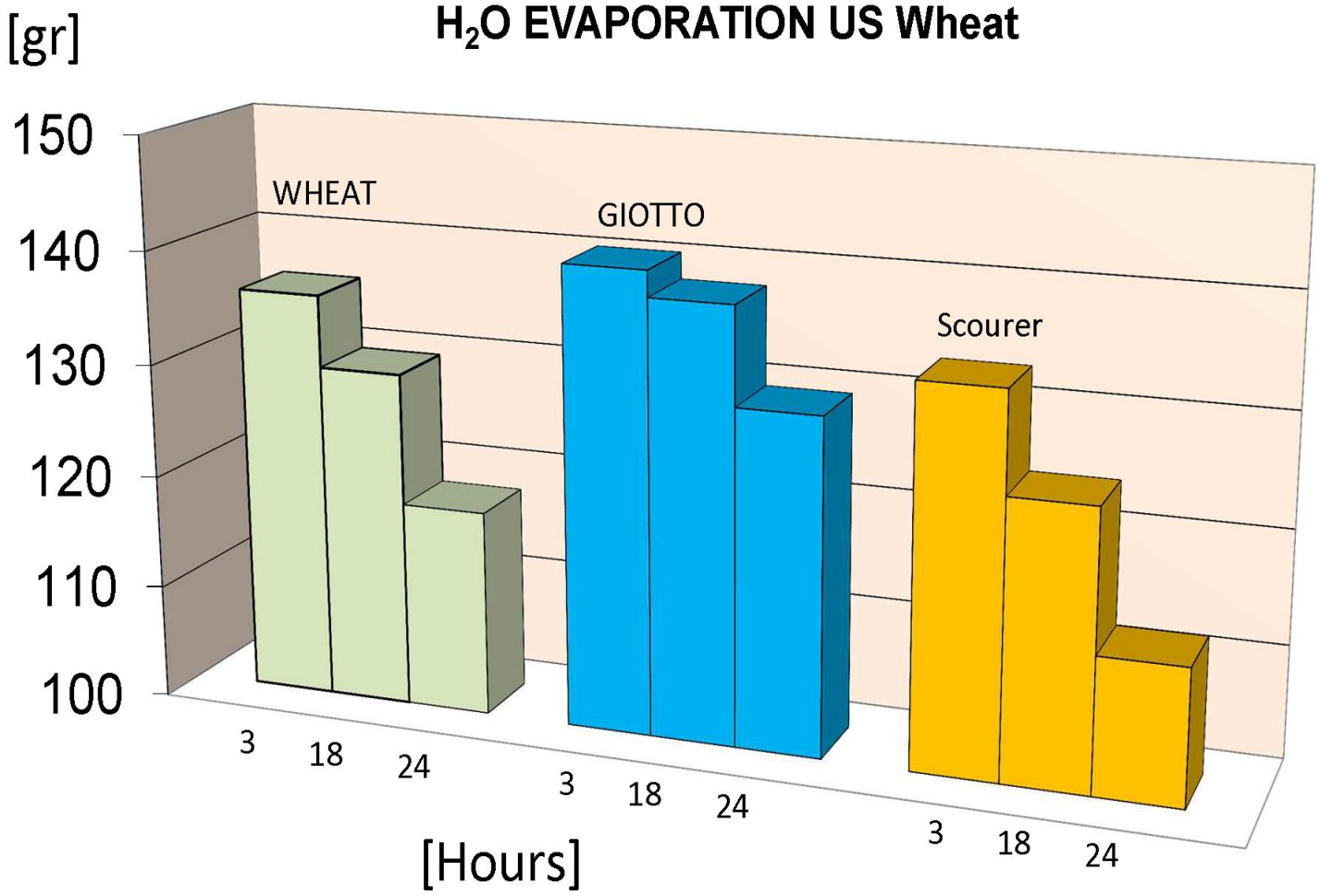
GIOTTO : SOFT HARD WHEAT DECORTICATOR

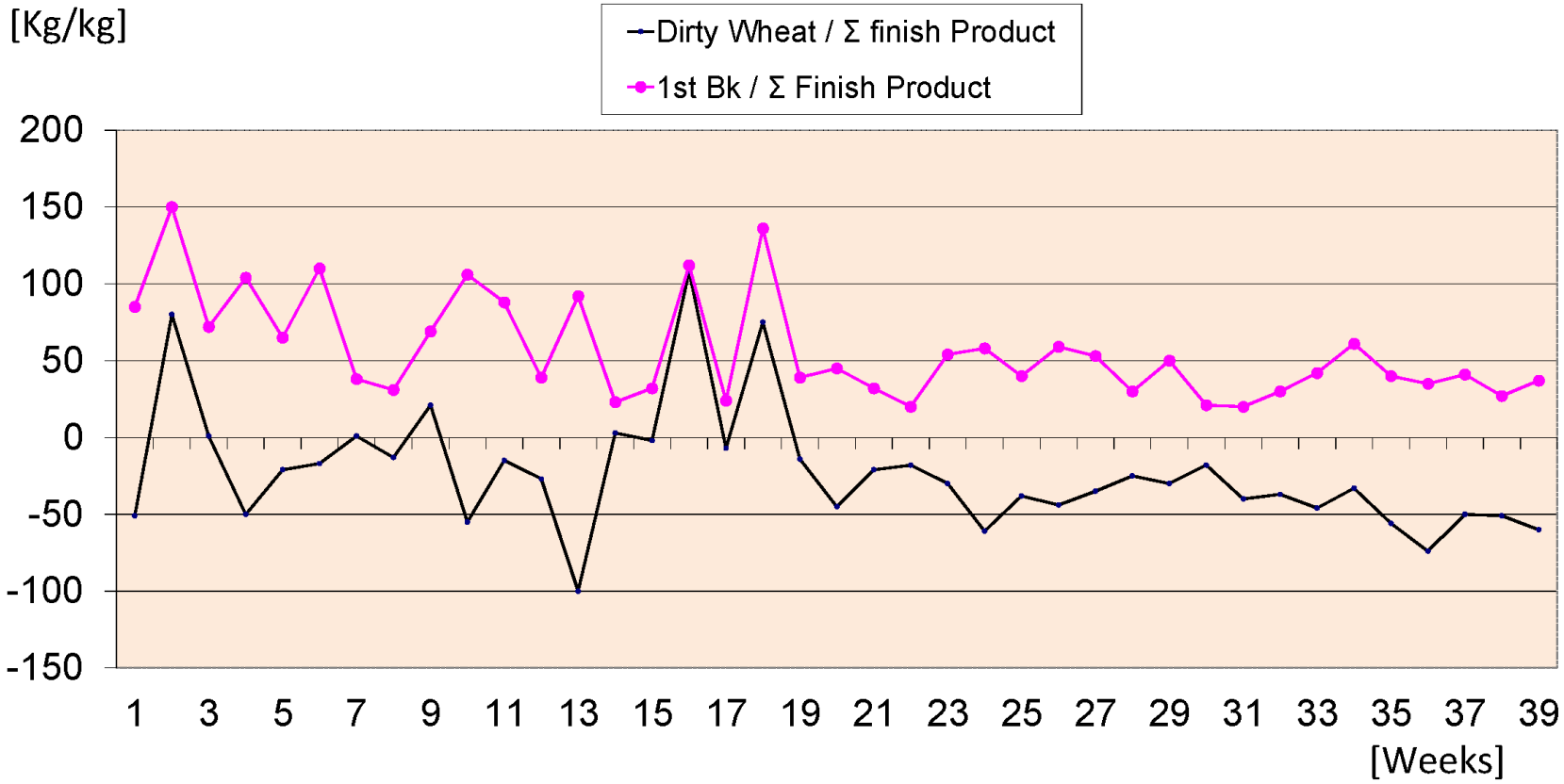
GIOTTO DECORTICATOR

GIOTTO INSTALLATION

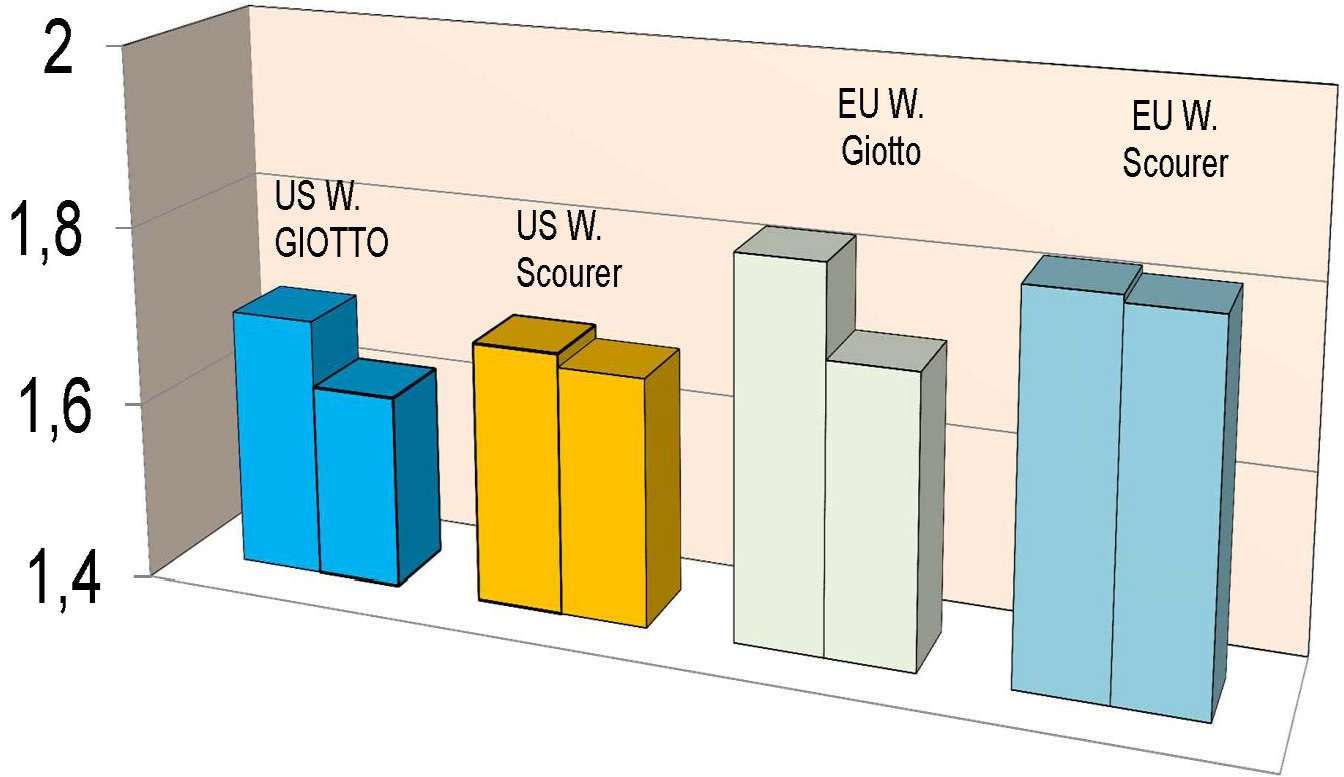


GIOTTO REMOVED PERICARP 0,2 – 1,5 %

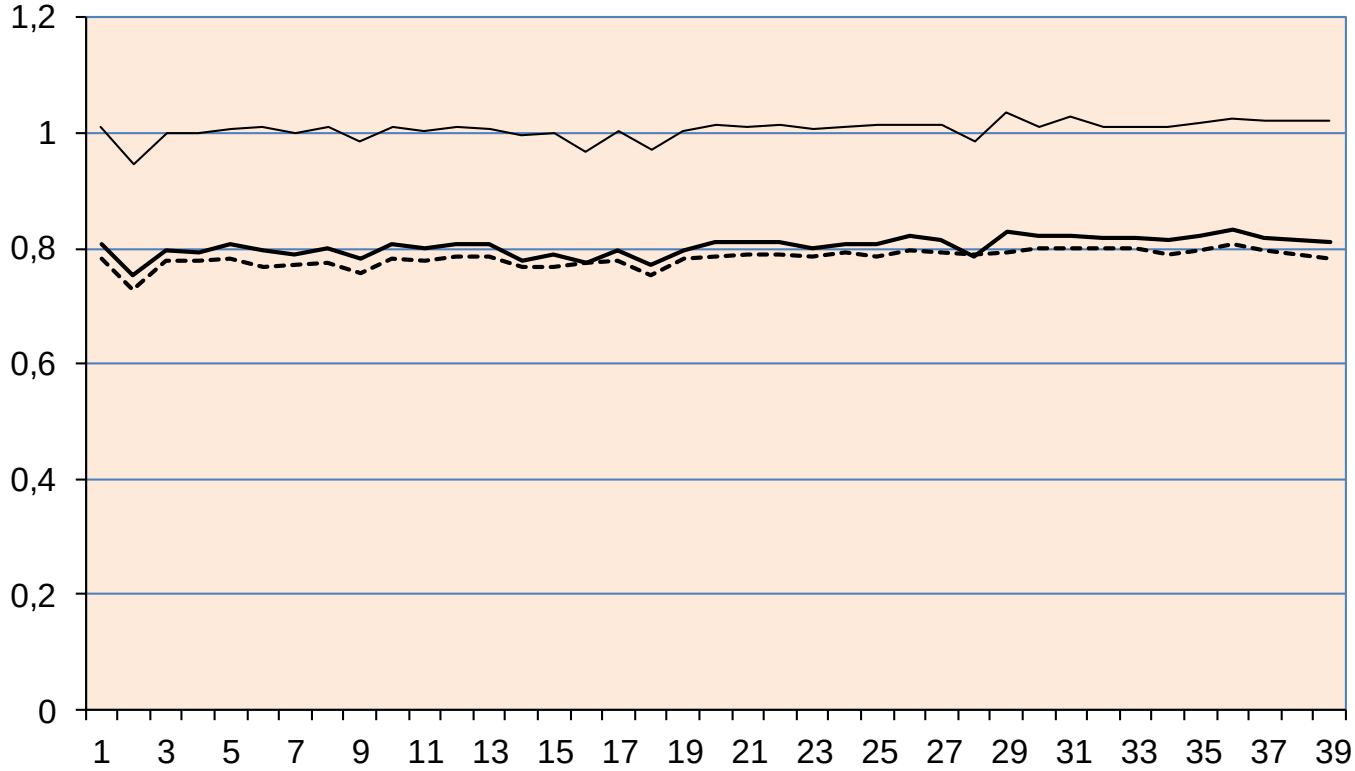

[gr]
H2O EVAPORATION US Wheat
150
140
130
120
110
100
WHEAT
GIOTTO
Scourer
3
18
24
3
18
24
3
18
24
[Hours]

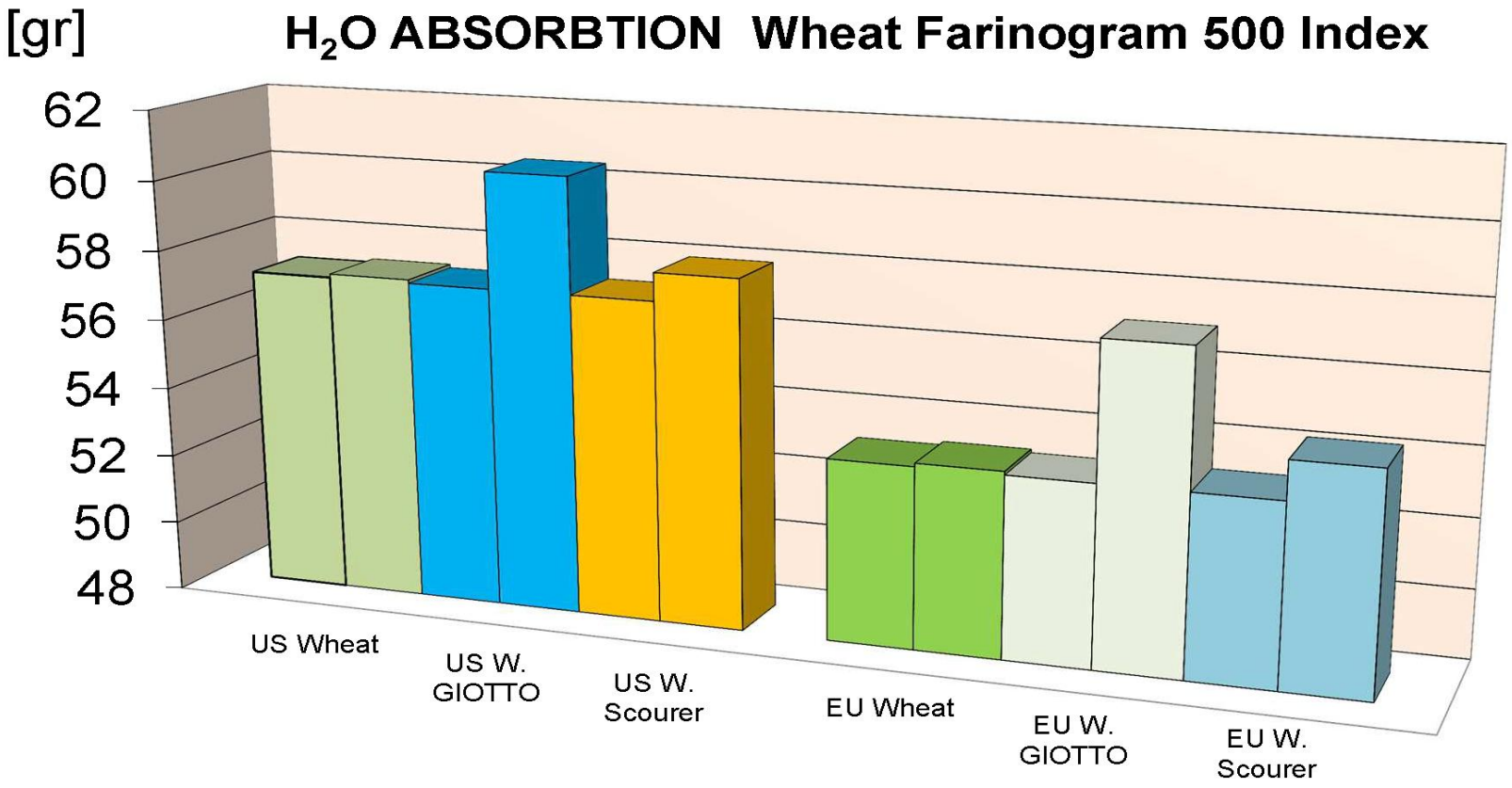

[Kg/kg]
Dirty Wheat / Σ finish Product
1st Bk / Σ Finish Product
200
150
100
50
0
-50
-100
-150
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
[Weeks]

ASH Reduction

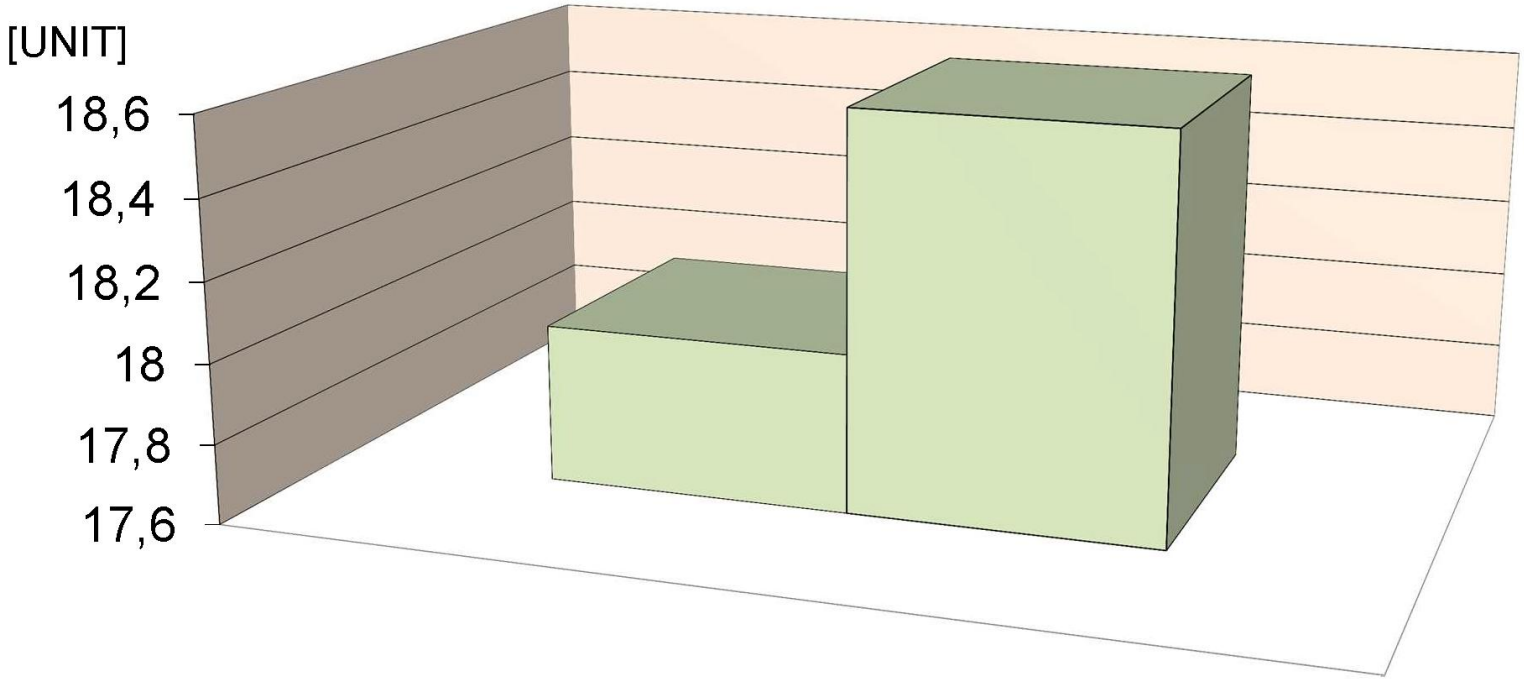


GIOTTO IMPACT ON MILLING YIELD

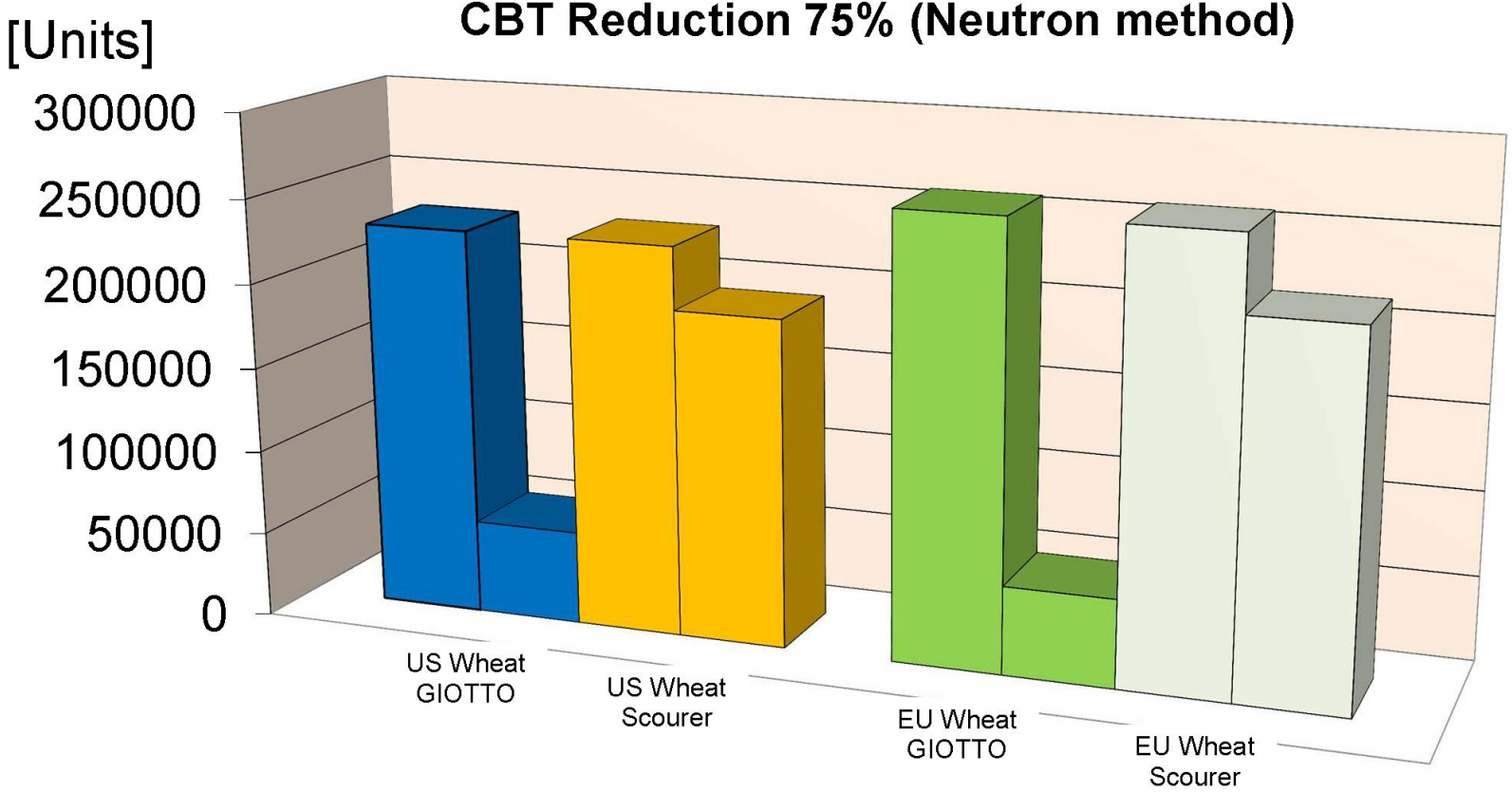



[gr]
H2O ABSORBTION Wheat Farinogram 500 Index
62
60
58
56
54
52
50
48
US Wheat
US W. GIOTTO
US W. Scourer
EU Wheat
EU W. GIOTTO
EU W. Scourer

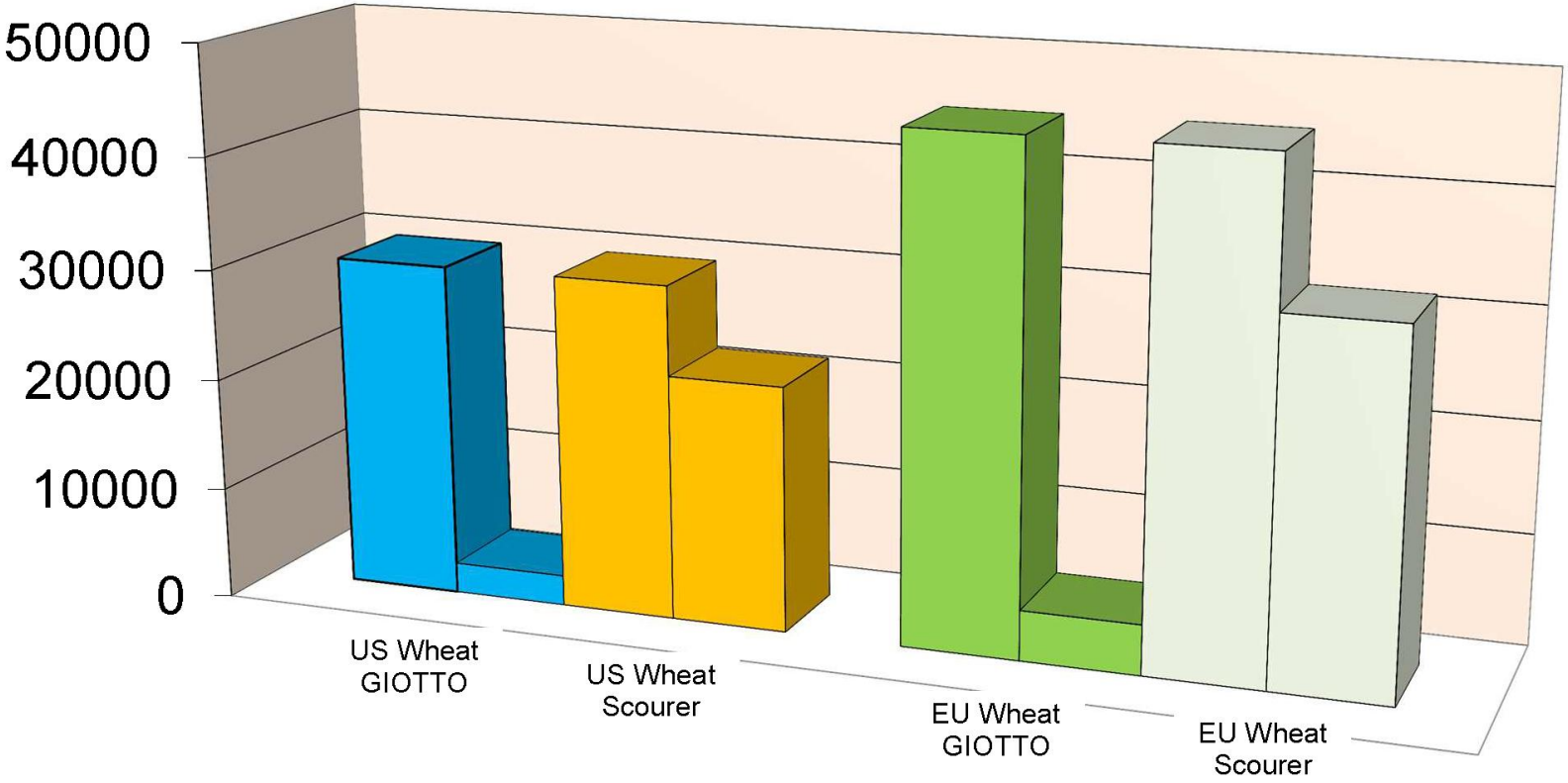
STARCH DAMAGED



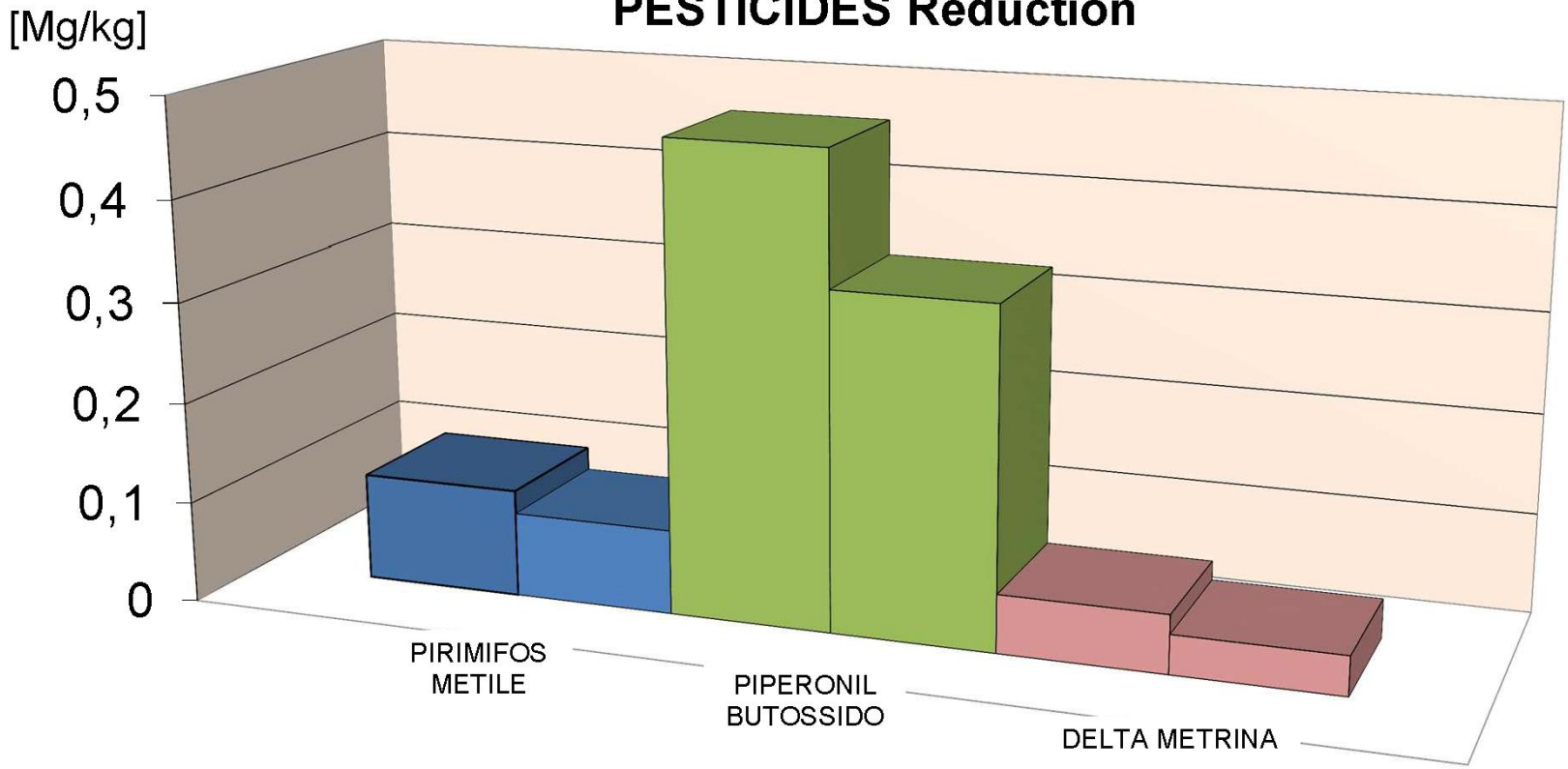
CBT Reduction 75% (Neutron method)



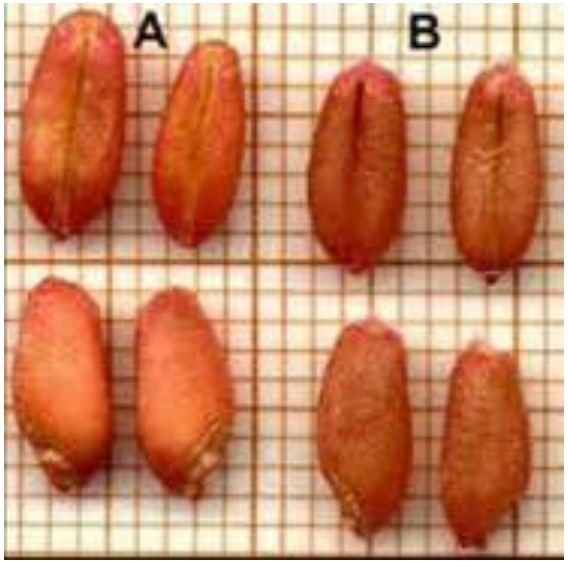
MOULD Reduction (ISO 21527-2:2008)



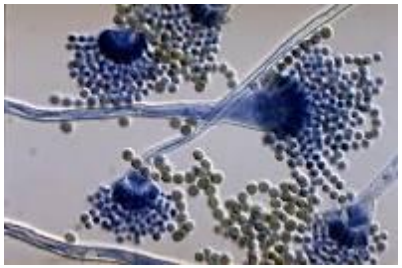
PESTICIDES Reduction



GIOTTO ON INFESTATED WHEAT KERNELS

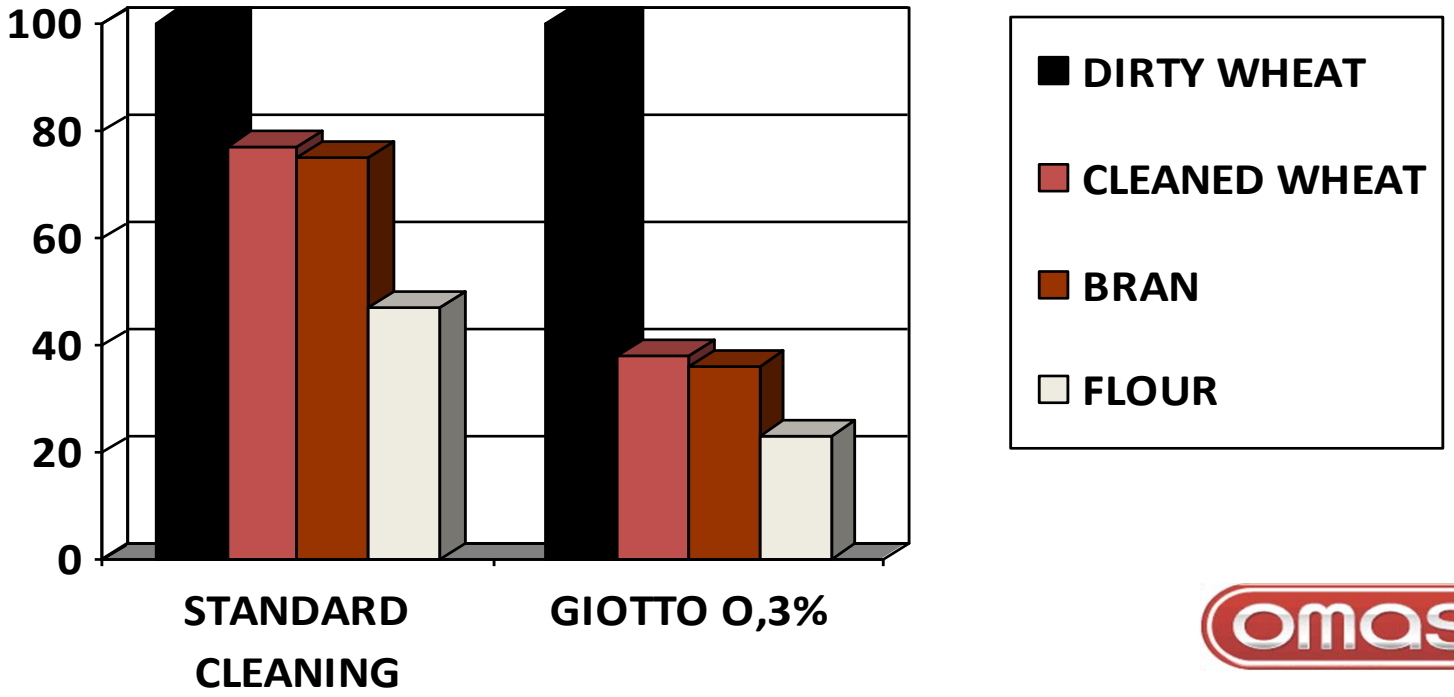


A ASPERGILLUS



B FUSARIUM

GIOTTO IMPACT ON MICOTOXINS DISTRIBUTION



GIOTTO ACHIVED GOALS

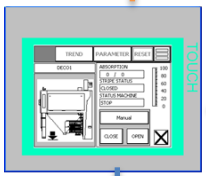
Giotto in operation produced the following results:

1) Reduction of tempering time from form 30 to 40 %
2) No variation of milling loss -0,1 % (+40.000 $ / year)
3) Reduction of water to be add to wheat 0,5 %
4) Decreased of the milling loss from 2,5 to 2 %
5) Reduction of sifter box cleaning (1st Break from 3-6 months)
6) Reduction of wheat ash contents 3 – 10 %
7) Low ash flour extraction increased of 1%

GIOTTO AUTOMATION

Motorized Outlet

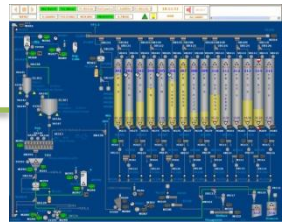
Giotto Local Board



Power Consumption

Plant Motor Control Center

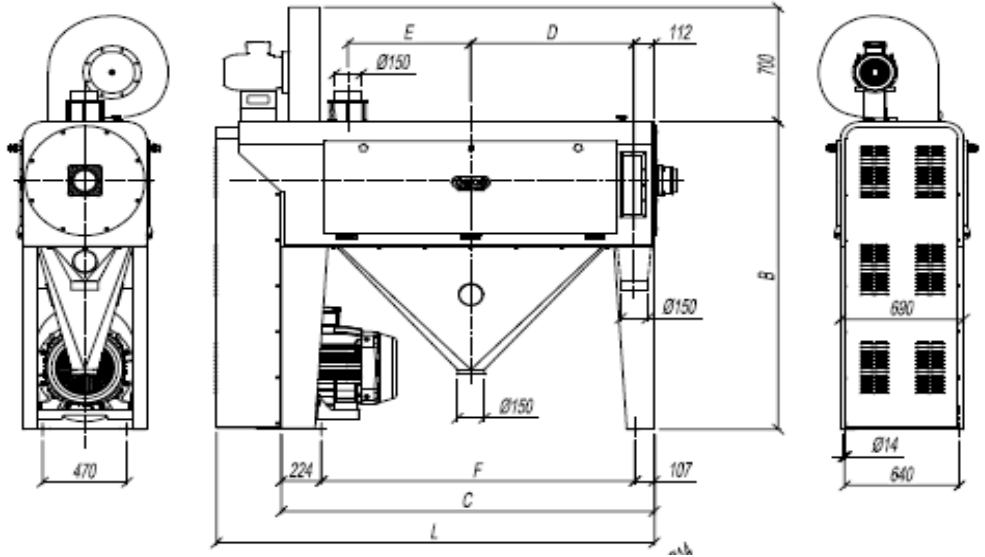
Plant Supervisor



GIOTTO ADDITIONAL BENEFIT

- HIGHER STANDARD OF CLEANING IN MILLING PLANT
- EXTENDED FLUTES LIFE ON BREAKS ROLL
- HEALTYER WHOLE MEAL FLOUR
- HEALTYER BY PRODUCTS

GIOTTO DATA SHEET



TIPO / TYPE	MOTORE / MOTOR [KW]	VENT. / FAN [KW]	Q. [T/h]	ASPIRAZIONE / ASPIRATION [m³/min]	L [mm]	L STACCIO [mm]	Ø MANTELLO [mm]	B [mm]	PESO [kg]	C [mm]	D [mm]	E [mm]	F [mm]
SSI50-22	22	2,2	10	60	1860	1000	520	1740	1400	1498	620	395	1167
SSI50-37	37	4	15	70	2250	1500	520	1880	1900	2083	912	687	1752
SSI50-45	45	4	20	80	2250	1500	520	1880	2000	2083	912	687	1752

THANK YOU FOR THE ATTENTION !!!