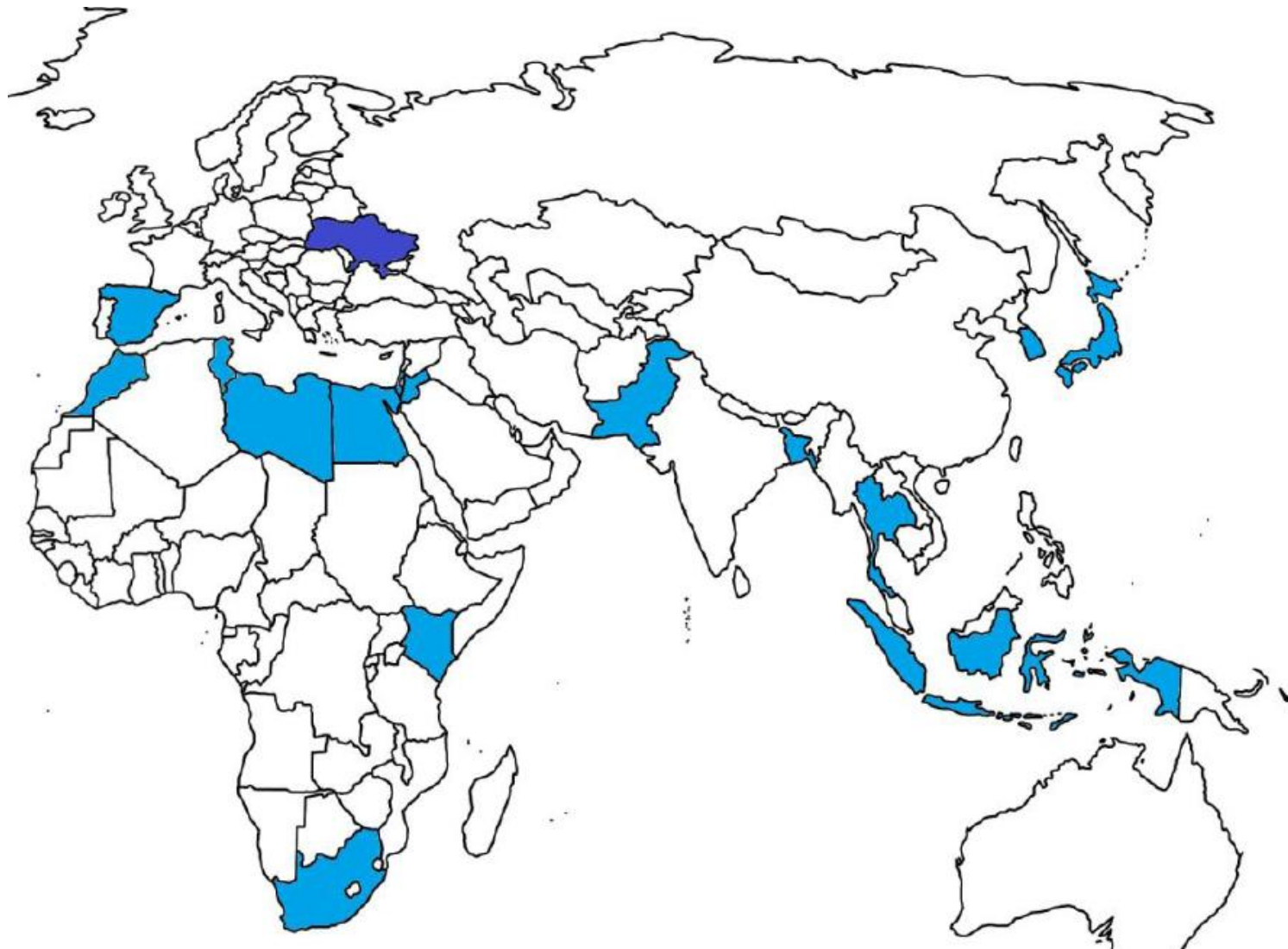




Control of Wheat and Flour Quality Improves Profitability

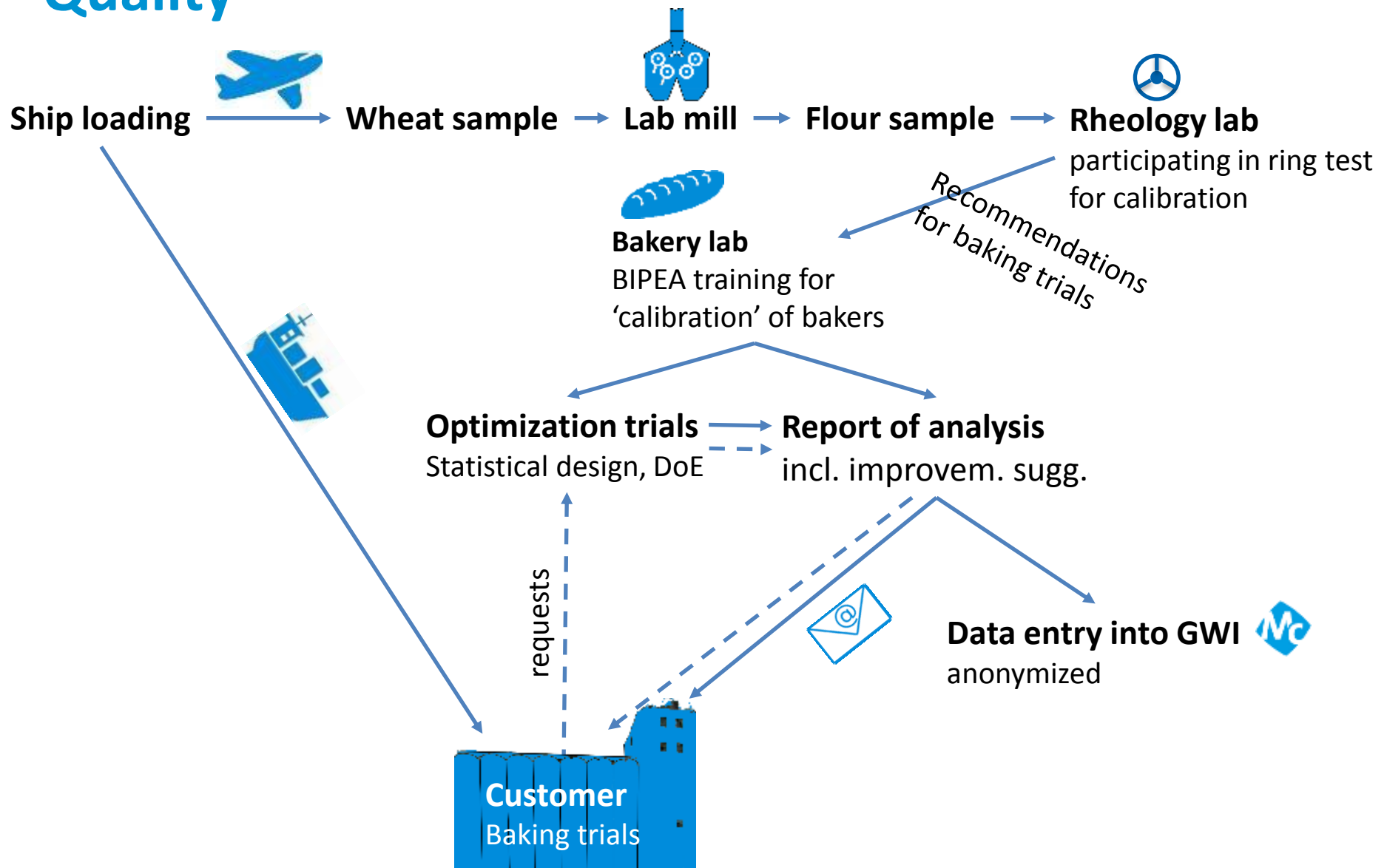
Lutz Popper, Ph.D., Head R & D
Mühlenchemie GmbH & Co. KG
Ahrensburg, Germany

The Challenge of Buying Wheat in a Globalized Market (here: Ukraine)



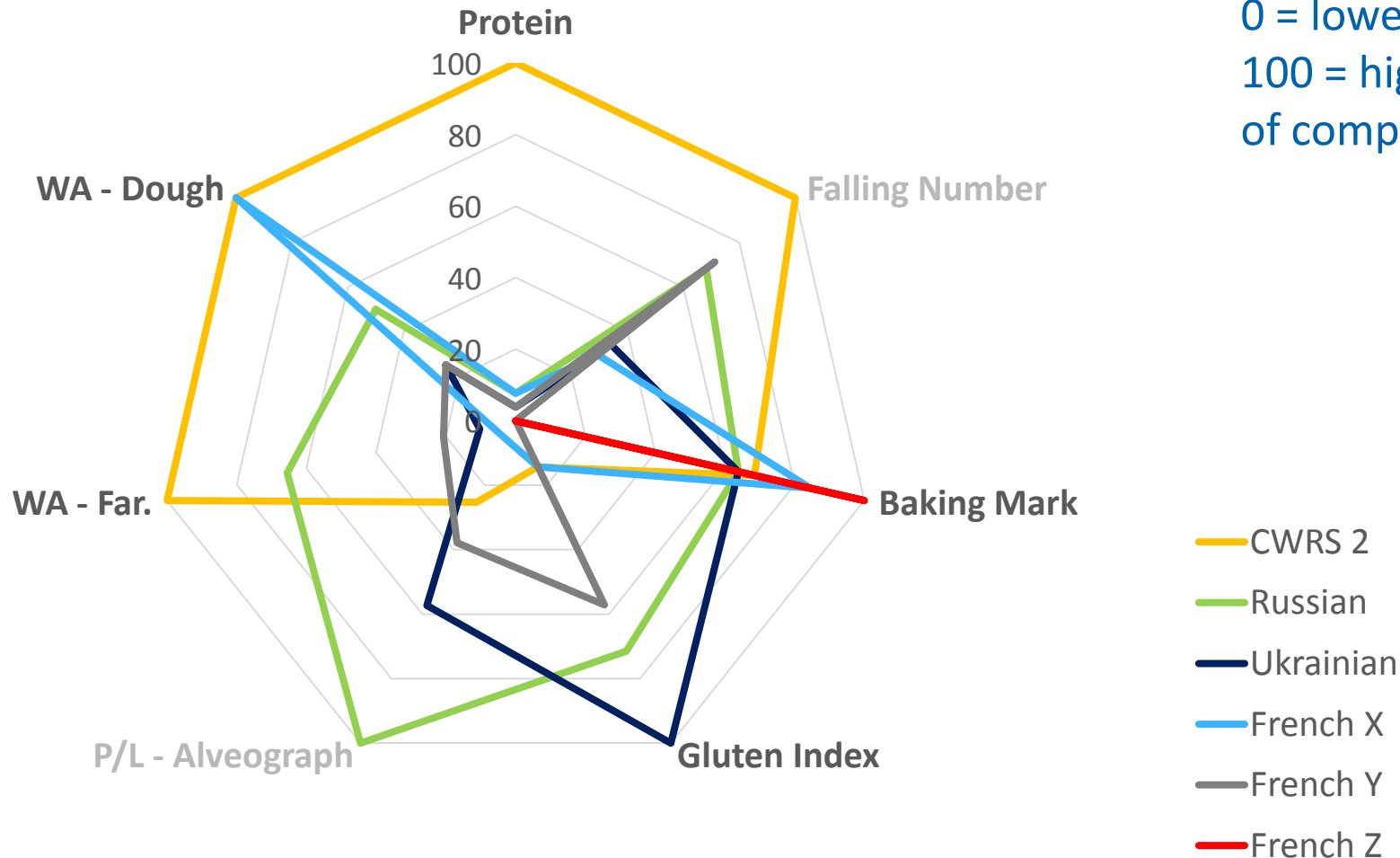
Kingwell et al., Australian Export Grains Innovation Center
"Top 15 Destinations for Ukrainian Grain 2013-2014"

Just-in-Time Examination of Wheat Quality



Comparison of Rheological Data and Baking Properties of Wheat from 4 Origins (2017/18)

0 = lowest value,
100 = highest value
of compared wheats



→ Protein & FN alone do not represent the wheat quality!

The MC Global Wheat Index: Compare your wheat

- ◆ A unique quality tool
- ◆ Online and as App for mobile device
- ◆ Free of charge
- ◆ Beta-version is accessible at
- ◆ <http://globalwheatindex.muehlenchemie.de/>

The MC Global Wheat Index: Compare your wheat

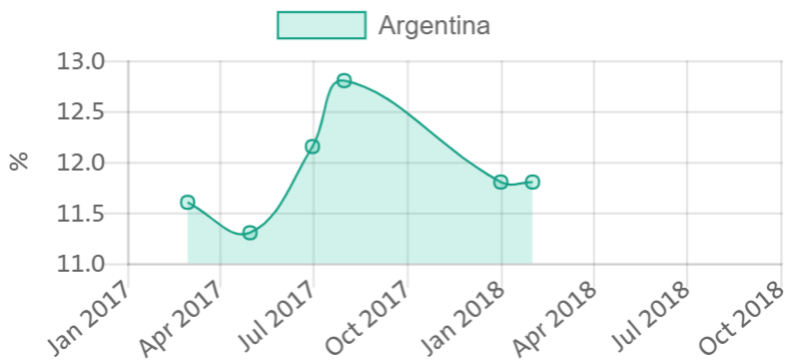
<http://globalwheatindex.muehlenchemie.de/>



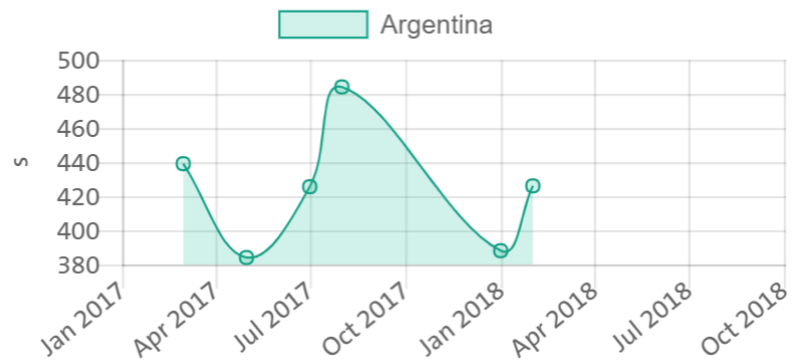
Incomplete Data may Hide Quality Risks



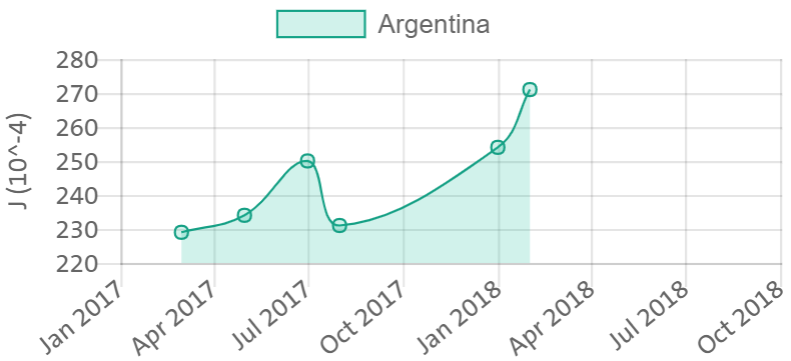
Protein - Wheat



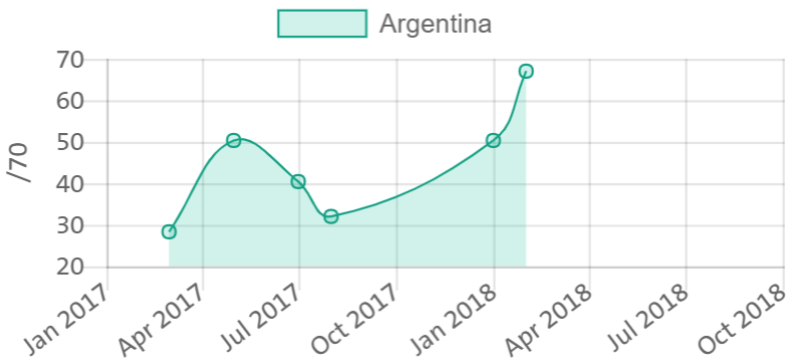
Falling Number



W - Alveograph



Bread Baking Mark

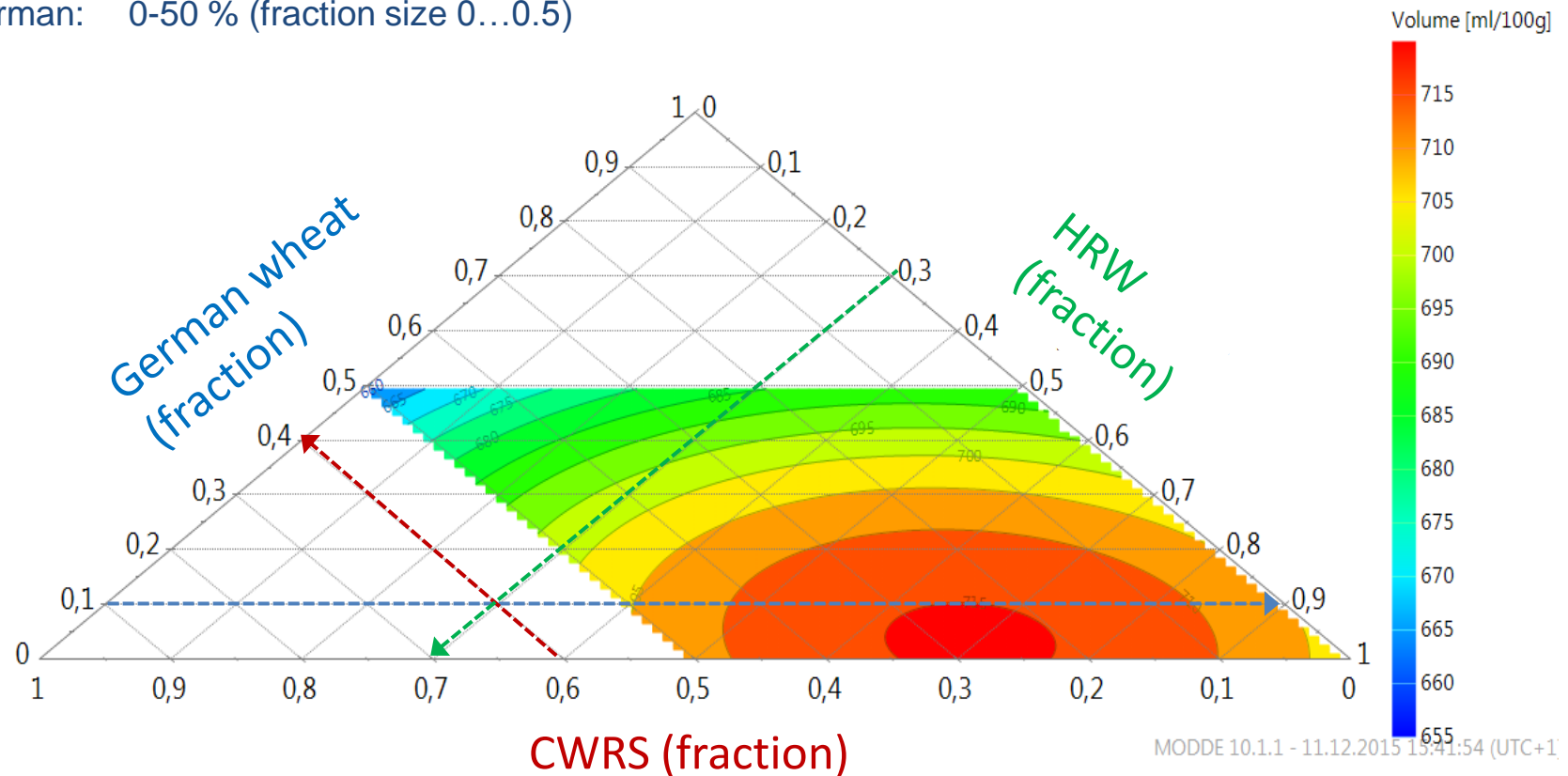


Provided by Global Wheat Index

Optimization of the Baking Performance (Volume Yield) of a Grist from 3 Wheats

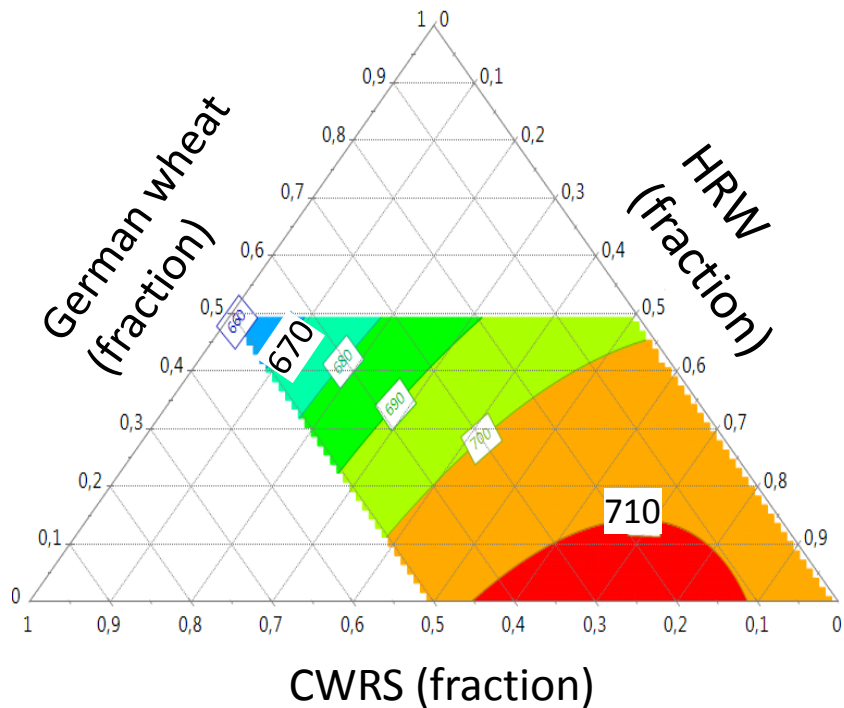
The sum of all mixture fractions is 100 %
(size = 1).

HRW: 0-100 % (fraction size 0...1)
CRWS: 0-50 % (fraction size 0...0.5)
German: 0-50 % (fraction size 0...0.5)

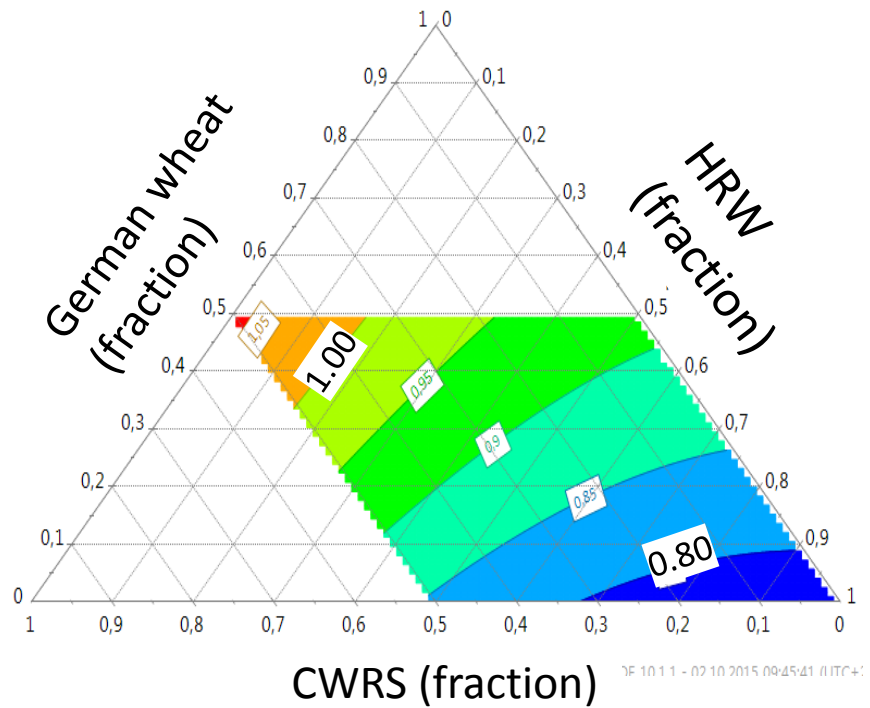


Different Targets May Require Different Grists

Volume yield



Alveograph P/L



Example: Replacement of Hard by Soft Wheat Flour Analysis – Overview

Property	Method	Dim.	Hard	Soft
Moisture	ICC-Standard No. 110/1	%	12.7	13.8
Protein	ICC-Standard No. 159	%	13.8	12.2
Wet gluten	ICC-Standard No. 155	%	27.4	26.7
Gluten Index	ICC-Standard No. 155		96	93
Falling Number	ICC-Standard No. 107	s	371	548
Ash content	ICC-Standard No. 104/1	%	0.67	0.64
Starch damage	ICC-Standard No. 172	%	6.1	6
Starch damage	ICC-Standard No. 172	UCD	25.7	25.4
Farinograph	ICC-Standard No. 115/1			
Water absorption		%	62.2	63.6
Development time		mm:ss	01:39	01:39
Stability		mm:ss	02:12	02:01
Softening 12 min after max.		FU	30	49

Hard Wheat vs. Soft Wheat Flour Baking Trials with Treatment Optimized by DoE



Wheat type	Hard wheat	Soft wheat
Treatment	Asco, enzymes	Powerzym, 140 ppm
Vol. normal proof	3,680 mL	3,900 mL
Vol. over-proof	4,420 mL	4,720 mL

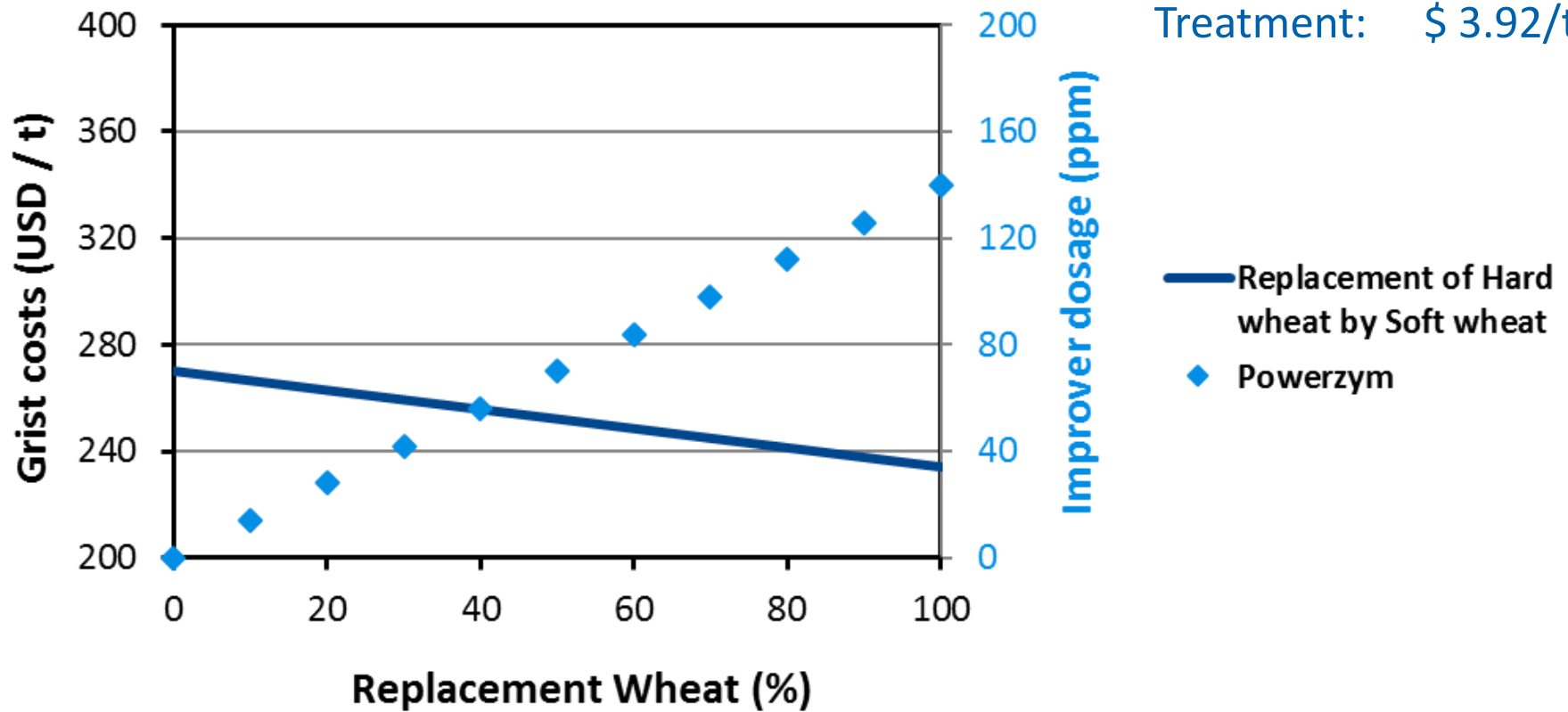
Higher Margins by Flour Improvement (1)

Januar 2018 (Dar, TZ)

Hard wheat: \$ 270/t

Soft wheat: \$ 230/t

Treatment: \$ 3.92/t



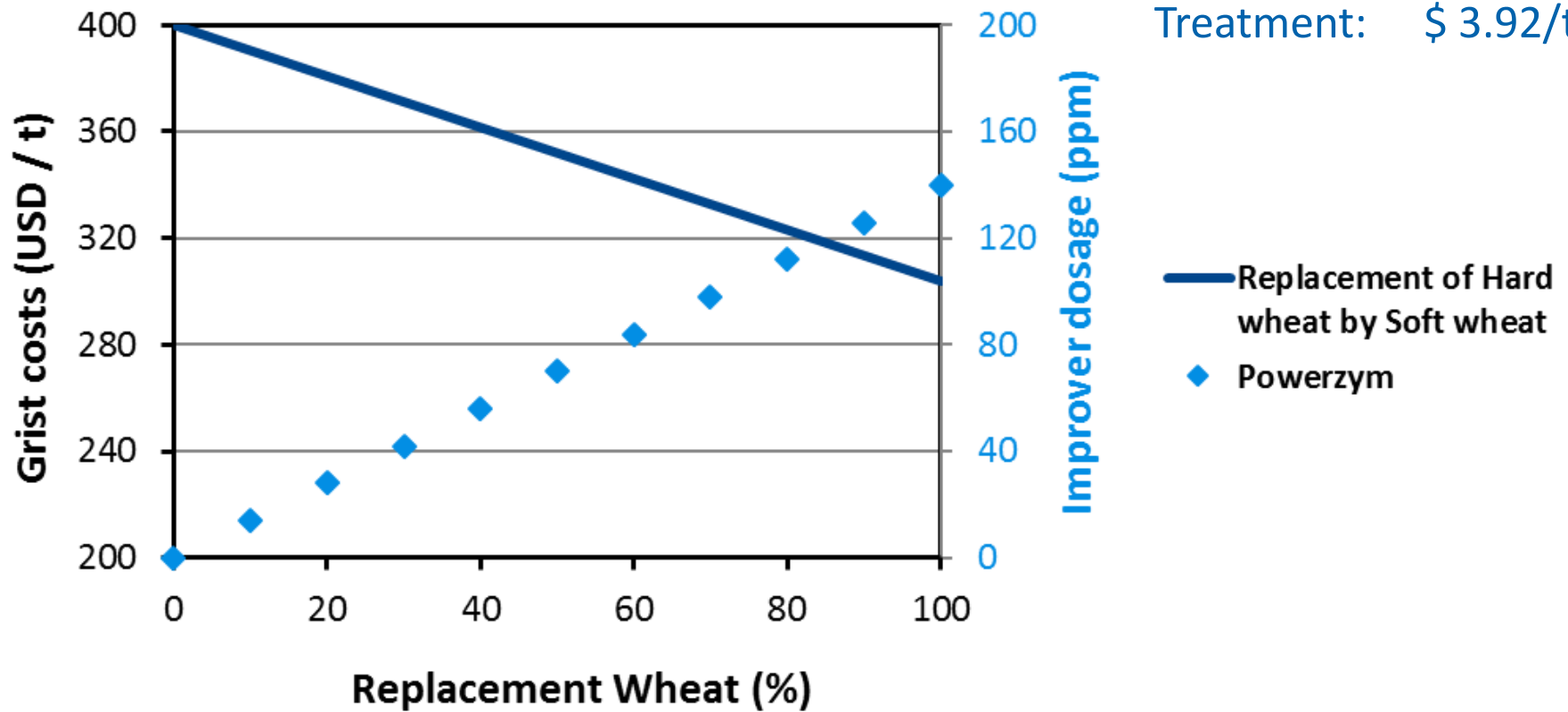
Higher Margins by Flour Improvement (2)

August 2018 (Dar, TZ)

Hard wheat: \$ 400/t

Soft wheat: \$ 300/t

Treatment: \$ 3.92/t



- ◆ **Wheat purchases should not be based on protein only**
- ◆ **Thorough wheat analysis allows the purchase of wheat most suitable for a specific application**
- ◆ **Soft wheat can be an alternative to hard wheat if improved accordingly**
- ◆ **Grist optimization increases customer satisfaction and earnings**

Thank you very much for
your attention!

