



Grist Cost Optimization through Improvement of Sensorial and Technological Properties of Pasta Flour

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

Mühlenchemie is a member
of the Stern-Wywiol Gruppe



Desirable Properties for Noodle Flour and Suitable Improvers

Properties

- ◆ **Easy processing**
 - Soft & extensible dough required
- ◆ **Uniform & quick drying**
 - Low water absorption
- ◆ **Bright color**
 - No specks, clear background, no darkening
- ◆ **Tolerance towards moisture from fillings**
 - Firm and closed (uniform) dough structure
- ◆ **Low leaking losses upon cooking**
 - Firm and closed (uniform) dough structure
 - Low starch damage
- ◆ **High cooking tolerance (low "soakiness")**
 - Firm and closed (uniform) dough structure
 - Low starch damage
 - Good protein quality

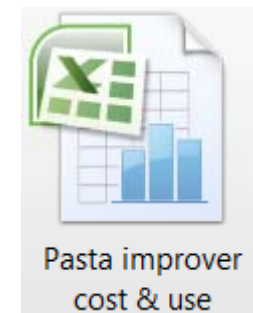
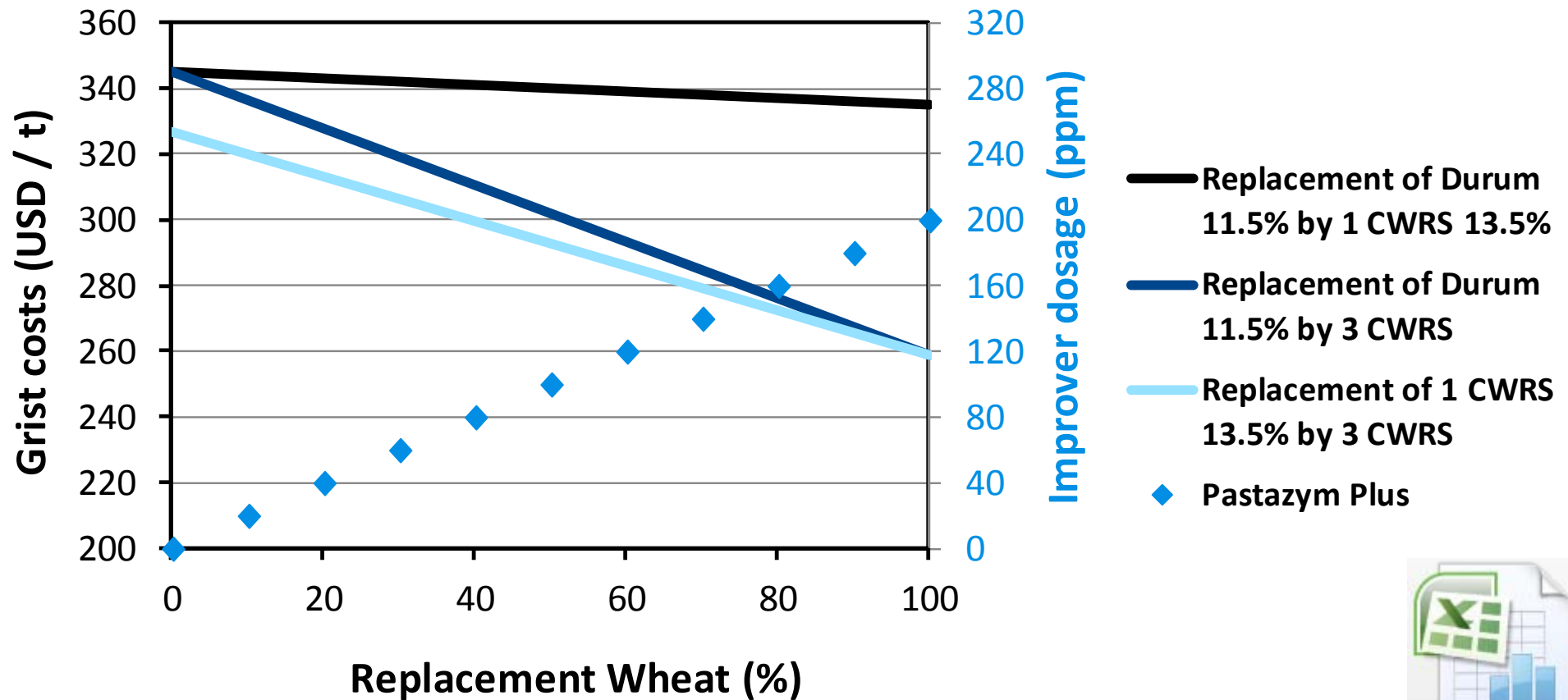
Improvers

- ◆ **Enzymes; softening agents**
 - Hemicellulases; cysteine
- ◆ **Enzymes**
 - Hemicellulases
- ◆ **Enzymes, colorants, anti-oxidants**
 - Lipoxygenase, food colors, ascorbic acid
- ◆ **Emulsifiers; hydrocolloids**
 - Monoglycerides; guar gum
- ◆ **Enzymes; proteins**
 - Carboxyl esterase
 - Transglutaminase
 - Vital wheat gluten



Pasta Flour - Grist Cost Optimization*

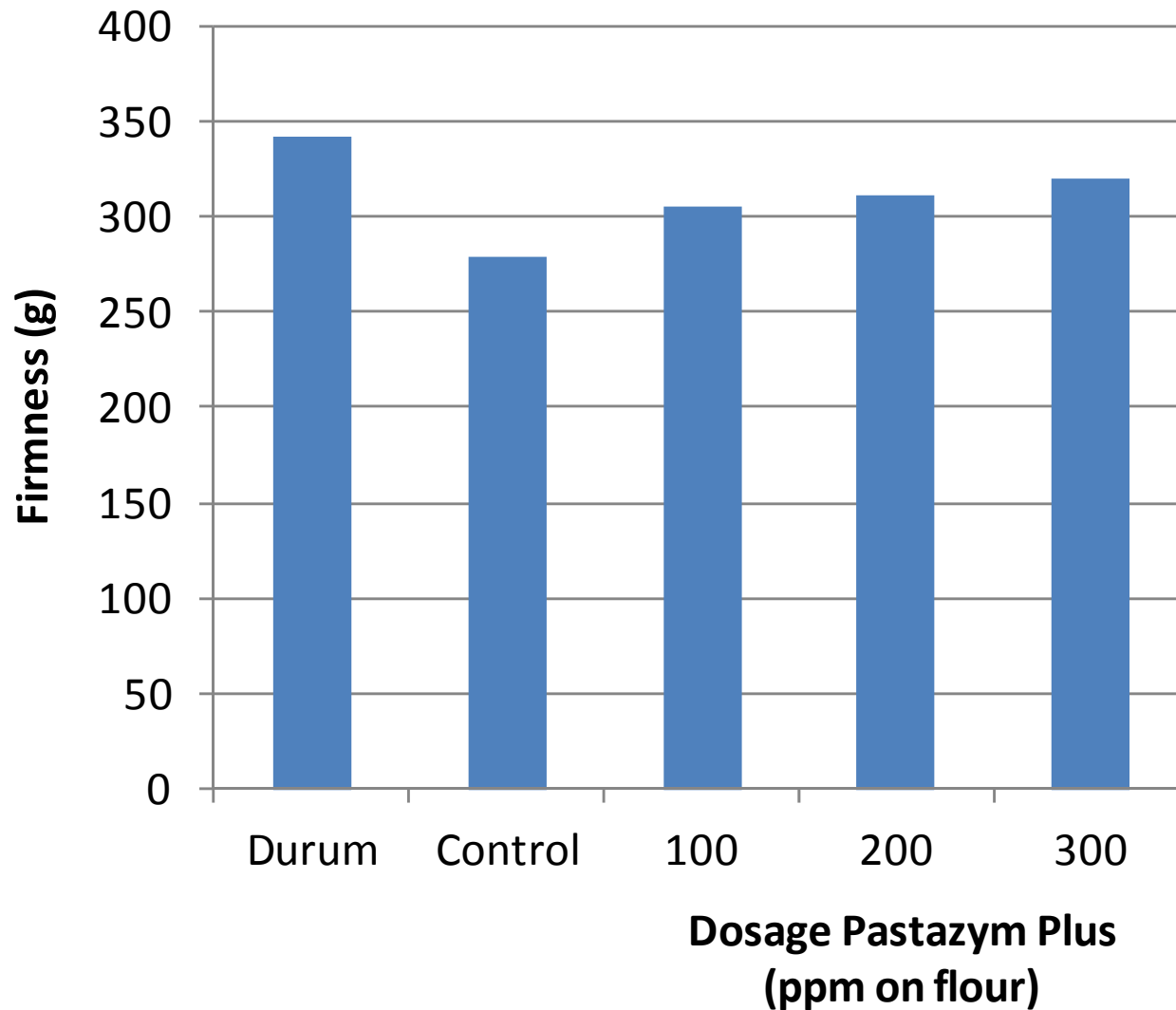
*August 2013 figures



Properties of Pastazym

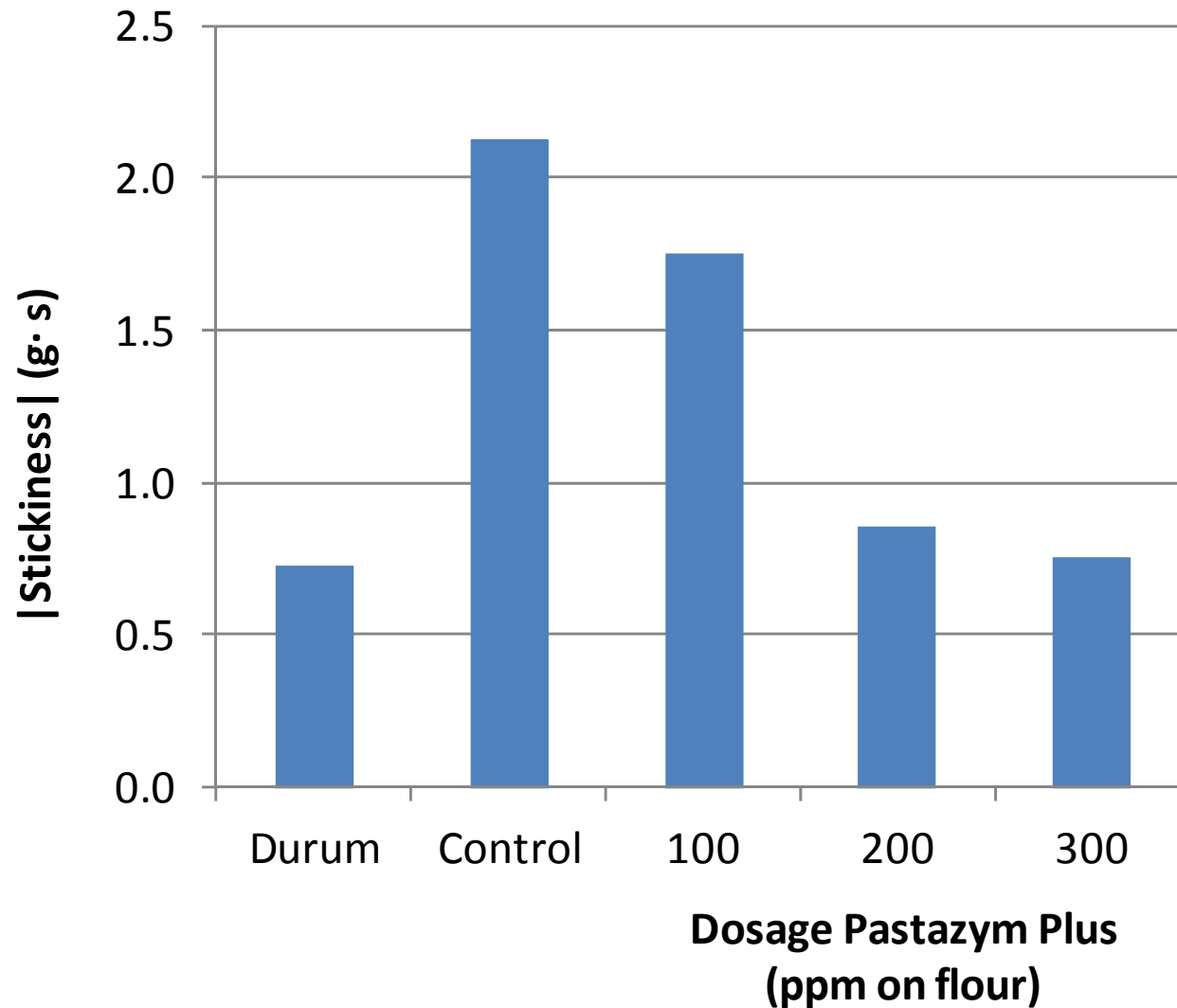
- ◆ For production of noodles from soft and hard wheat
- ◆ Improves color and brightness
- ◆ Increases the firmness of cooked noodles
- ◆ Enhances overcooking tolerance
- ◆ Reduces oil uptake of fried instant noodles
- ◆ Reduces drying time of noodles
- ◆ Improves surface appearance and mechanical stability of dried noodle and pasta products
- ◆ Allows for a reduction of raw material costs.

Firmness of Cooked Pasta from Hard Wheat Flour as Affected by Carboxyl Esterase



Control: Pasta from HRW flour without added enzymes

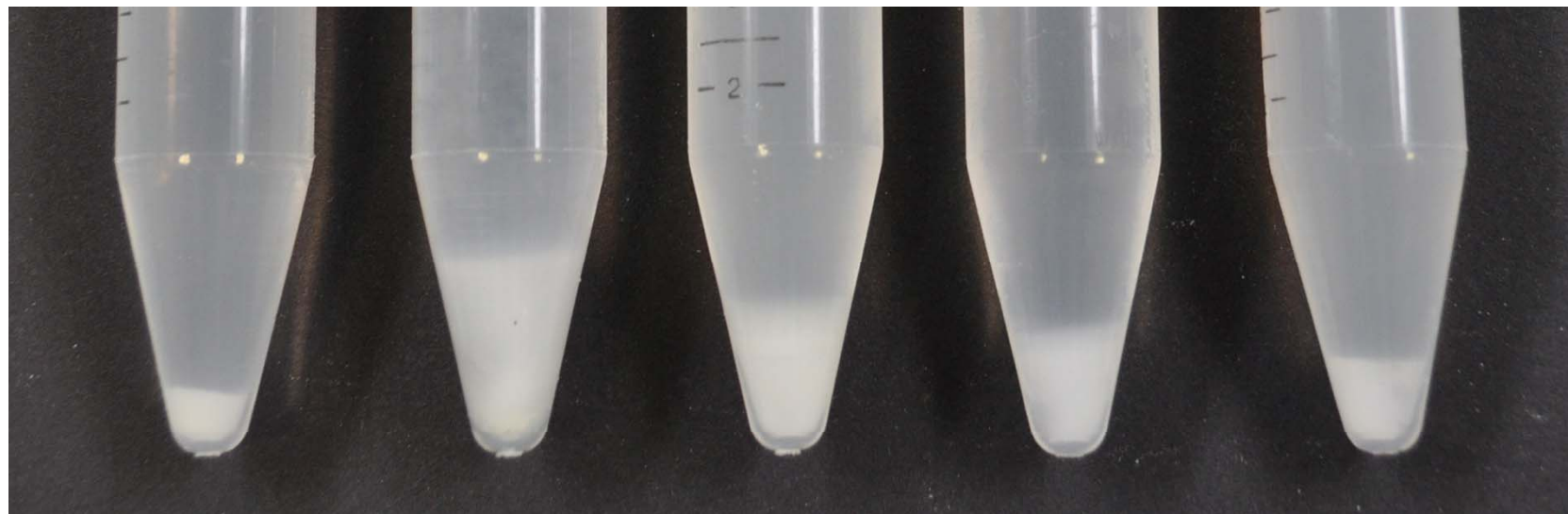
Stickiness of Cooked Pasta from Hard Wheat Flour as Affected by Carboxyl Esterase



Control: Pasta from HRW flour without added enzymes

Effect of carboxyl esterase on cooking losses from hard wheat pasta

Starch leakage into cooking water



Durum

Control

100

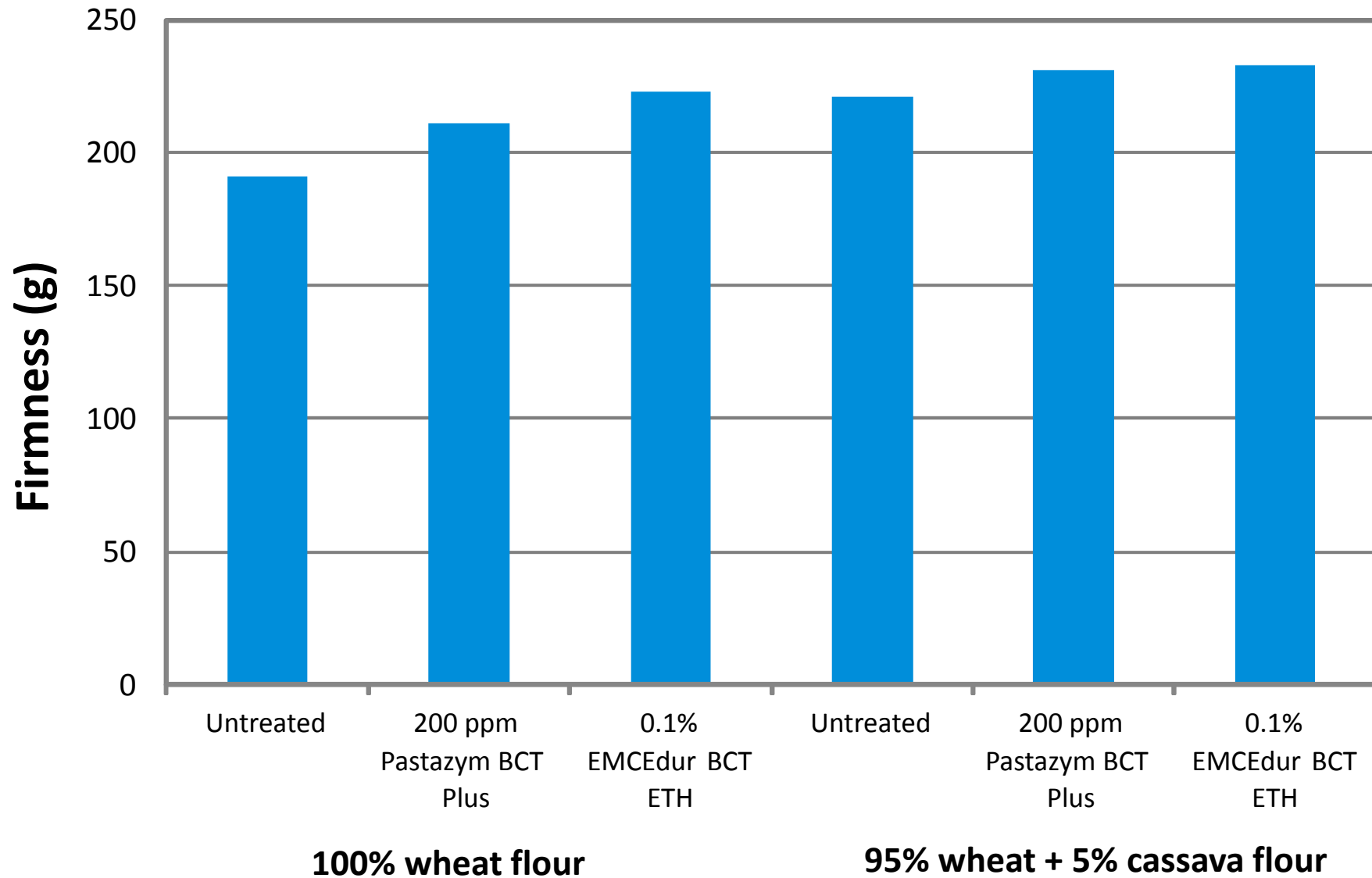
200

300

**Dosage Pastazym Plus
(ppm on flour)**

Control:
Pasta from HRW flour without added enzymes

Improvement of the Texture of Cooked Spaghetti from Composite Flour



Improvement of the Colour of Cooked Spaghetti from Composite Flour (95% wheat + 5% cassava flour)

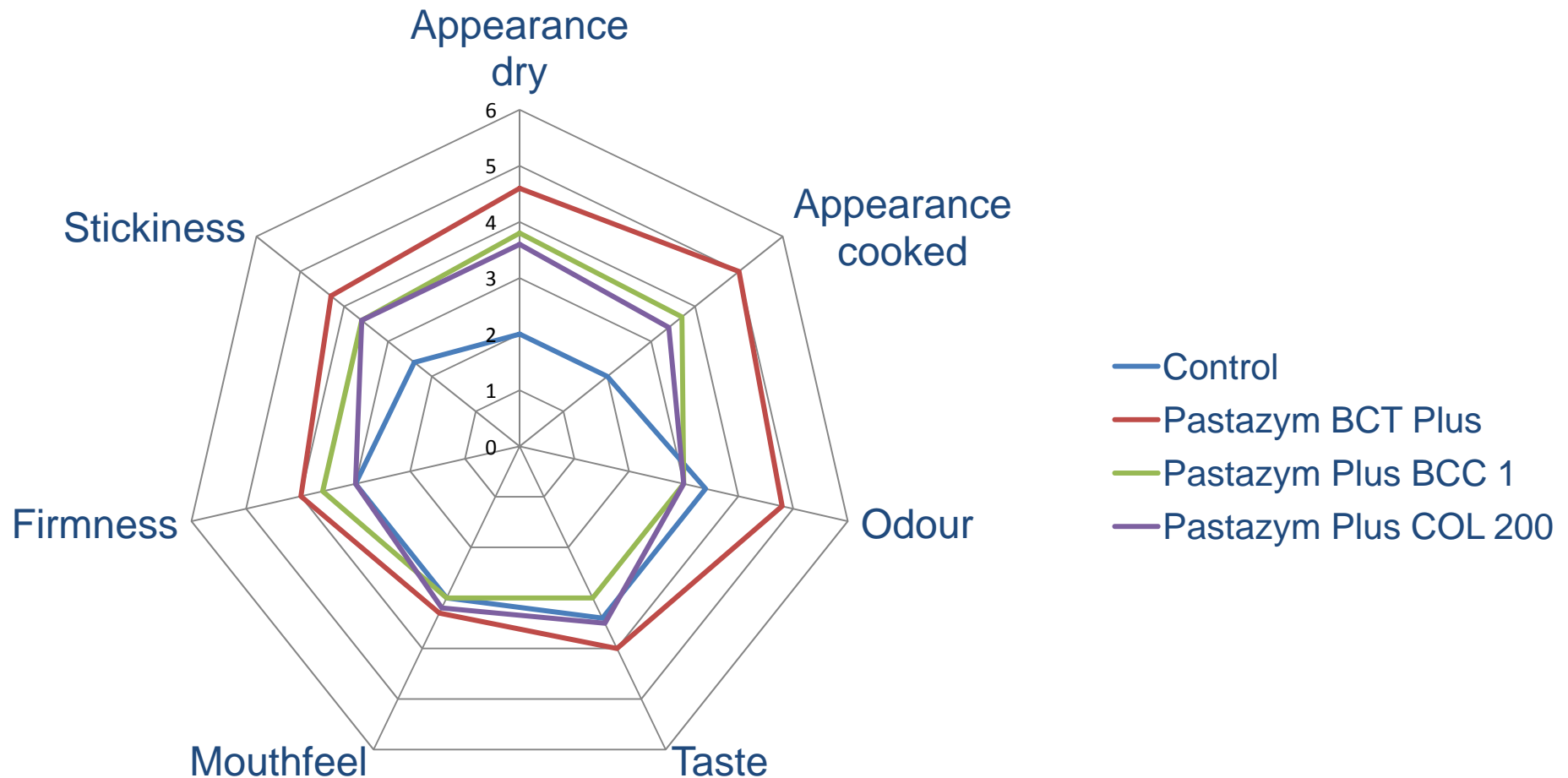


Untreated

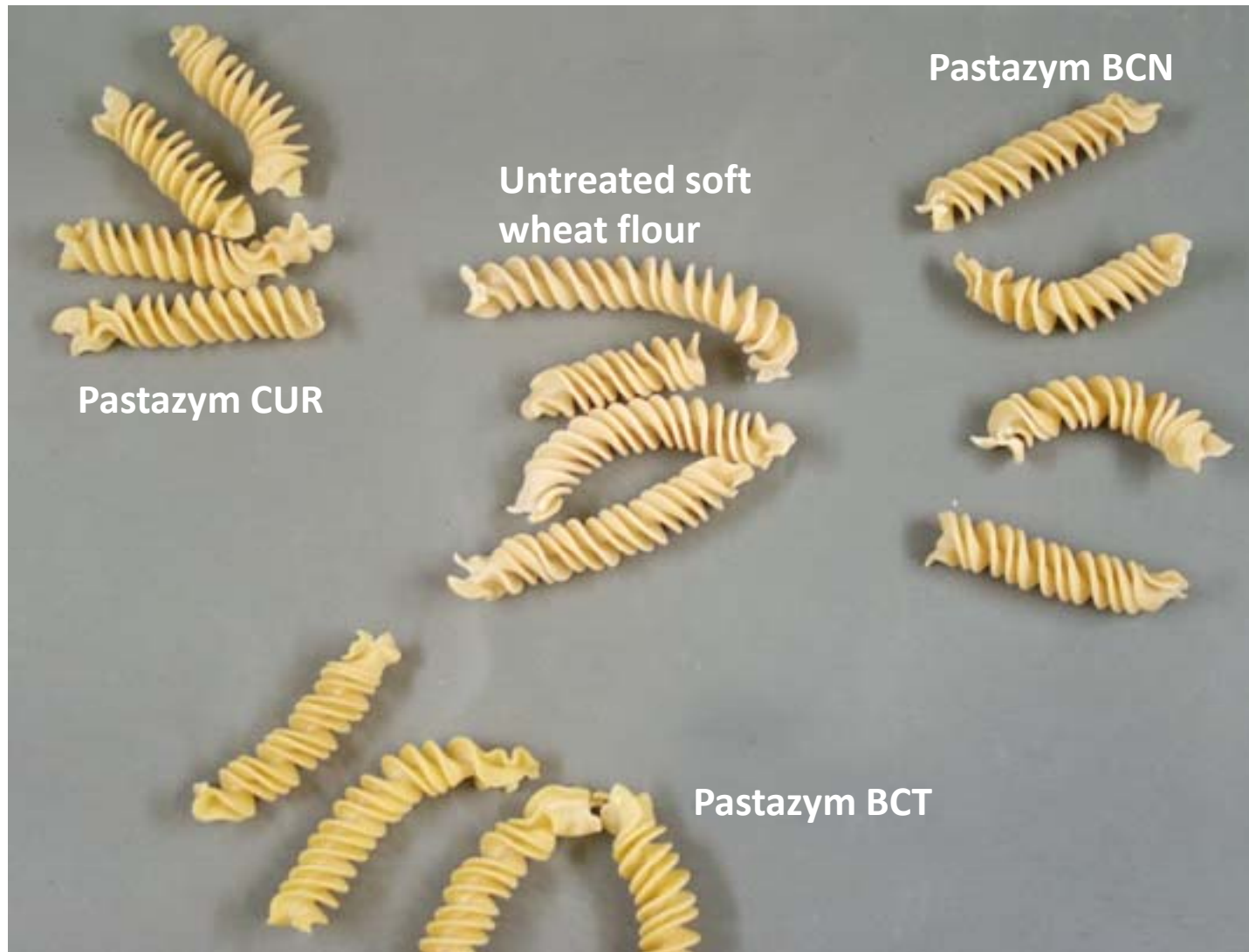
**0.1% EMCEdur
BCT ETH**

**200 ppm Pastazym
BCT Plus**

Organoleptic Evaluation of Pasta from Composite Flour (80 % Hard Wheat/20% Cassava)



Durum Colour for Soft Wheat Pasta



Effect of Pastazym CUR on the Colour of Cooked Pasta from Soft Wheat Flour



Pastazym CUR 500 ppm

Untreated

→ **Pastazym CUR reduces the greyish shine of pasta made from soft wheat flour**

Pastazym Range – Various Products for Different Targets

	Pastazym	Pastazym CUR	Pastazym Plus	Pastazym BCT Plus	Pastazym Plus COL 200
Colour	-	+	-	+	+
Brighthening	+	n.a.	+	n.a.	n.a.
Improves properties of soft wheat to resemble high quality of hard wheat or durum	+	+	+	+	+
Improve surface appearance	+	++	+++	+++	+++
Improve mechanical stability	+	+	+	+	+
Improve firmness of cooked pasta	+	++	++	++	++
Improve overcooking tolerance	+	++	+++	+++	+++
Stickiness	+	+	+++	+++	+++

n.a.= not applicable

MC Pilot Pasta Plant

Vacuum pasta press



Controlled moisture hot air dryer



Mühlentchemie GmbH & Co. KG

- a member of the Stern-Wywiol Group -

Kurt-Fischer-Str. 55
22926 Ahrensburg, Germany
+49 4102 202 001

www.muehlenchemie.de
www.stern-wywiol-gruppe.de



Leader in flour applications.