



Leader in flour applications.

## Partners of the international milling industry – “We make good flours even better!”

**Marvin Jaeger**

Area Sales Manager East and Southern Africa

**Annette Büter**

Technical Application Manager – Flour fortification

# Agenda:

- 1. Introduction to Mühlenchemie**
- 2. Fortification Premixes for Maize flour**

# Your Contact Persons



**Marvin Jaeger**  
Area Sales Manager



**Maximiliane Schneider**  
Sales



**Axel Röhrs**  
Food Technologist  
Baking



**Sven Mattutat**  
Food Technologist  
Baking



**Lennart Flügge**  
Sales



**Asanda Hewana**  
R&D South Africa



**Annette Büter**  
R&D Fortification



**Jana Russnak**  
R&D Pasta



**Melanie Nickschat**  
Fortification Repr.  
Uganda





**90**  
Years

Celebrating the 90th anniversary of Mühlenchemie

## We are flour ...

- 93 years of experience
- Over 2,000 customized products for flour improvement and flour fortification
- Contacts with 1,000 mills internationally
- Exports to over 100 countries



1923



1960



2013

# Stern-Wywiol Gruppe – owner-managed

Under the umbrella of the group, eleven German ingredients firms cooperate as a centre of excellence





## We believe in communication ...

... with our customers, international organizations and research scientists from many disciplines. Progress in flour improvement can only be achieved through dialogue.

### International symposium “Future of Flour”

1991, 2004, 2007, 2011, 2017

### Fruitful partnerships:

**2000** Mutual support with the Flour Fortification Initiative (FFI), the Global Alliance for Improved Nutrition (GAIN), WHO and Helen Keller International

**2010** Renewal of strategic cooperation with BASF

**2015** Member of the SUN Business Network

### Ahrensburg Technology Centre:

**2003** Establishment of the Technology Centre in Ahrensburg

**2012** Enlargement to 3,000 m<sup>2</sup> of laboratories and training facilities





**Mühlchemie**  
makes good flours even better

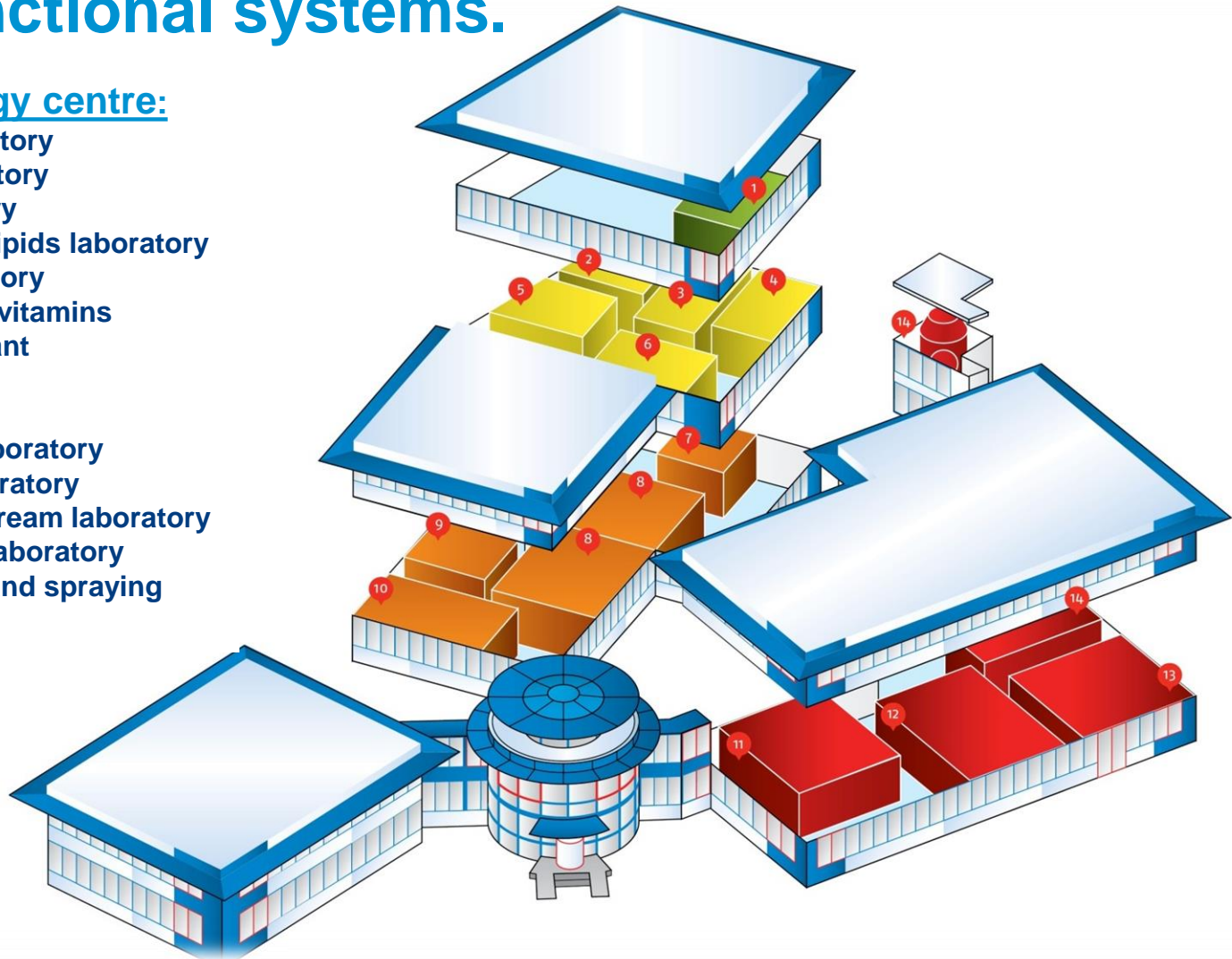
# Technology Center Ahrensburg



# We explore our customers' wishes and develop new functional systems.

## The technology centre:

1. Sensory laboratory
2. Enzyme laboratory
3. Pasta laboratory
4. Lecithins and lipids laboratory
5. Flavour laboratory
6. Laboratory for vitamins
7. Milling pilot plant
8. Trial bakery
9. Analytics
10. Rheological laboratory
11. Deli foods laboratory
12. Dairy and ice cream laboratory
13. Meat and fish laboratory
14. Fluidized bed and spraying technology





# Baking Laboratory



# Baking Laboratory



# Pasta Laboratory



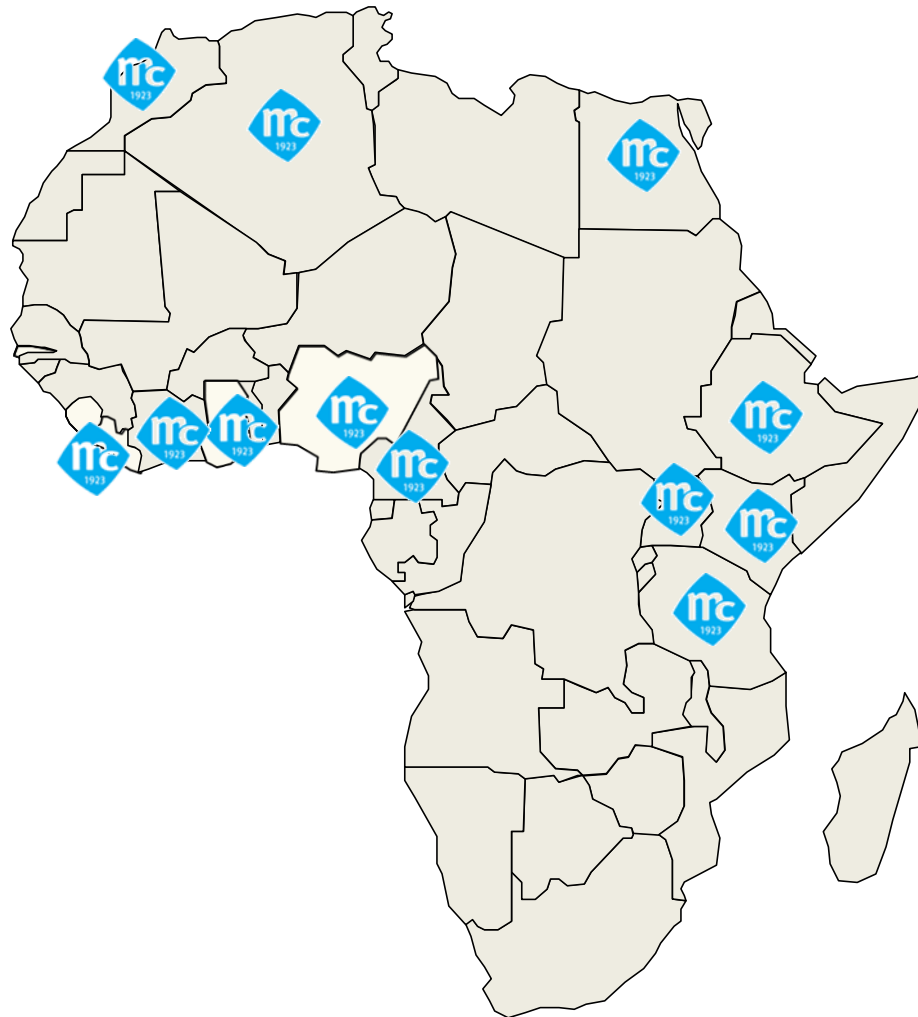


# Mühlenchemie workshops and training events

- Conduct of training events, seminars and workshops
  - at our Technology Centre and
  - at our customers' facilities worldwide
- Product development
- Conduct of tests and analysis of the flour for its rheological properties
- Development of tailor-made solutions



# Mühlentchemie Workshops in Africa



# Production Plant Wittenburg

## ◆ Fluidized bed technology



## ◆ Fully-automated production lines







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# Maize flour fortification

# Ingredients of a premix for maize flour



Vitamin B12



Free flowing agent  
(silicon dioxide)



Folic acid



Zinc  
(zinc oxide)



Iron  
(Na Fe EDTA)



Carrier  
(maize starch)



# Ingredients of a premix for maize flour

Vitamin A powder



Vitamin B1 & B6



Niacin



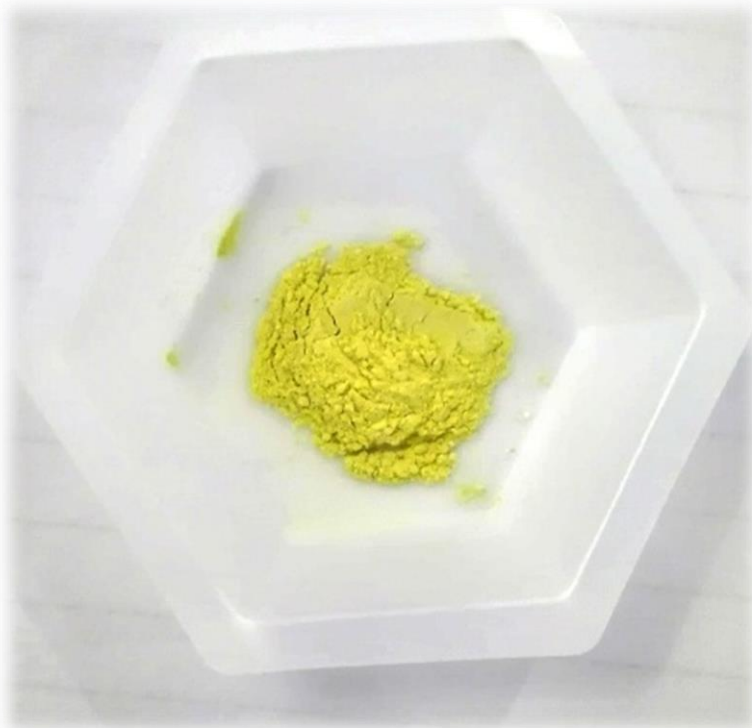
Vitamin B2



# Ingredients of a premix for maize flour

Premix: ELCOvit 13514 according to East African Standard for maize flour

Dosage to flour: 500 ppm (0.5 g to 1 kg of flour)



# Stability of vitamins

	Light	Heat	Oxygen	Humidity
Vitamin A	xxx	xx	xxx	x
Vitamin B1	xx	xxx	x	xx
Vitamin B2	xxx	x	x	x
Niacin	x	x	x	x
Vitamin B6	xx	x	x	x
Vitamin B12	xx	x	x	xx
Folic acid	xx	x	xxx	x

x = hardly or not sensitive  
 xx = sensitive  
 xxx = very sensitive



# Shelf life of the micronutrient premix

## Example of premix specification listing composition of premix

**Storage and shelf-life:** Min. 12 months if stored dry in closed original packing at temperatures < 25°C. Rapid and substantial changes in ambient temperatures during storage and handling should be avoided.

**Packaging:** Cardboard box with aluminium inliner.

**The premix' shelf life refers to minimum levels in the premix – NOT to the end product !**

### Chemical Characteristics

Property	Method	Dimension	Target	Min	Max
Vitamins/minerals:					
Vitamin A (retinol)		g/kg	1,38	1,24 -	1,51
Vitamin B1 (thiamin)		g/kg	6,60	5,94 -	7,26
Vitamin B2 (riboflavin)		g/kg	4,40	3,96 -	4,84
Niacin		g/kg	32,78	29,502 -	36,058
Vitamin B6 (pyridoxine)		g/kg	4,40	3,96 -	4,84
Folic acid		g/kg	1,32	1,188 -	1,452
Vitamin B12 (cyanocobalamin)		mg/kg	19,25	17,33 -	21,18
Zinc		g/kg	72,60	65,34 -	79,86
Iron		g/kg	22,00	19,8 -	24,2

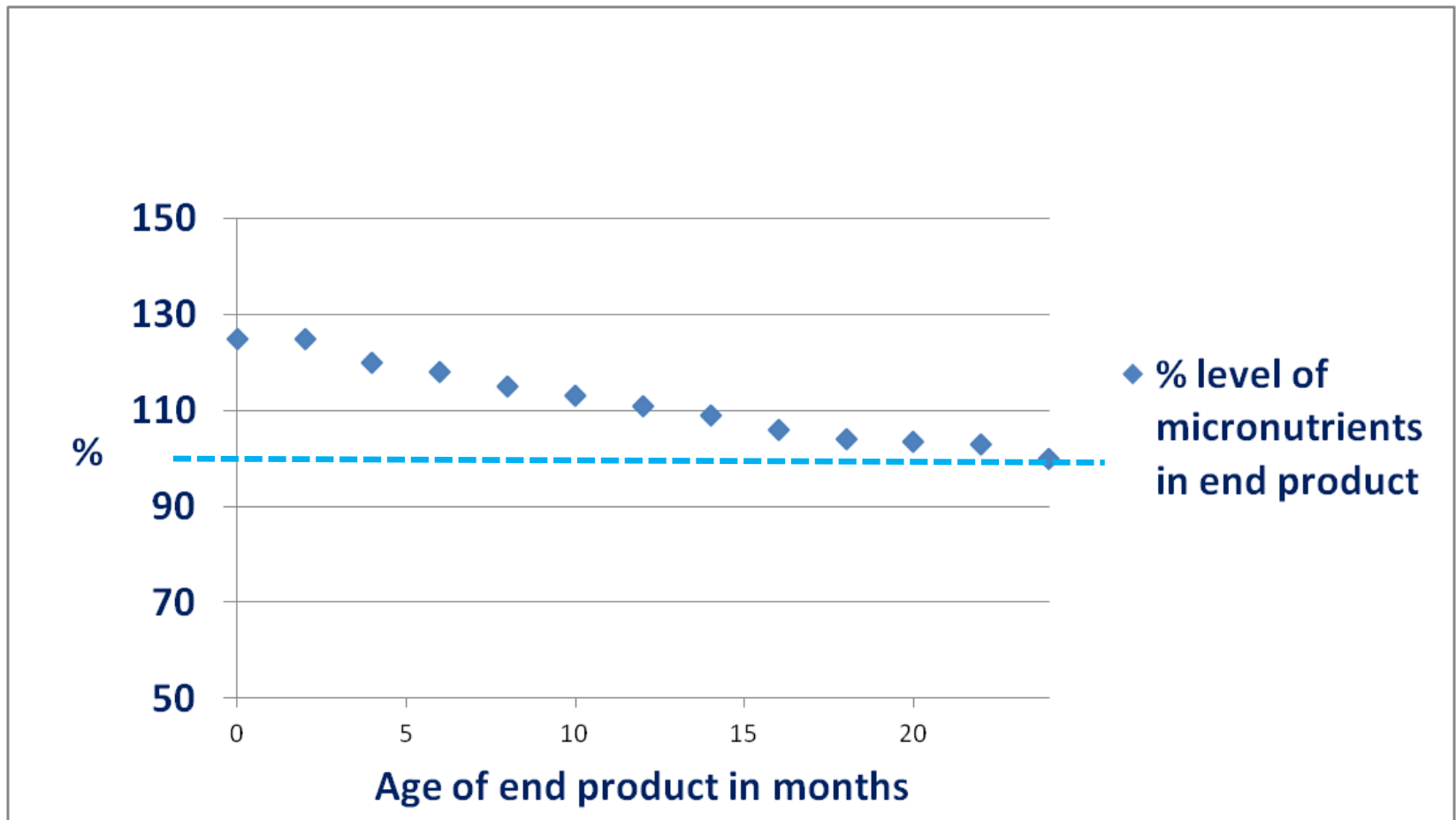
# Shelf life of end product

## Micronutrient premix

The premix is designed to meet the targets in the end product. Overages ensure micronutrient levels are sufficient throughout shelf life

Vitamin A	0,55 mg
Vitamin B1	3,30 mg
Vitamin B2	2,20 mg
Niacin	16,39 mg
Vitamin B6	2,20 mg
Folic acid	0,66 mg
Vitamin B12	7,70 mcg
Zinc	36,30 mg
Iron	11,00 mg

# Levels of micronutrients in end product over shelf life





# Advantages of using micronutrient premixes

- Constant ratio of ingredients allows for easy application and low risk of error
- Analysis of premix level in flour (QC) by using only one constituent as indicator
- Free-flow agents allow for homogeneous addition
- Mühlenchemie's knowledge of best ingredients and solution for milling industry
- Mühlenchemie's support with trouble-shooting and analytical services

# These factors ensure an easy handling:

## Protect premix from moisture and heat

- Storage conditions
  - < 75% r.H
  - <25°C / 77°F
- Aluminium packaging



## Flowable premix

- Free flowing agents
- Appropriate carrier



## Appropriate feeder



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# Fortified flour – vitamins for a healthy life

[www.muehlenchemie.de](http://www.muehlenchemie.de)



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