



Cereal Partners Worldwide
Nestlé and General Mills



A Cereal Manufacturer's View on Acrylamide: Challenges and Pathways Forward within the framework of BMLs and MLs



Contents

- Who we are – CPW; Breakfast Cereal Manufacturer
- RTE breakfast cereals: Some key info on our product direction
- Manufacturing and Acrylamide - The everyday challenges
- Upcoming Acrylamide legislation changes and Compliance challenges
- Summary note



We are Cereal Partners
Worldwide

WE MAKE BREAKFAST BETTER

Put simply, we are a global company founded by the partnership of Nestle & General Mills and connected by a passion for breakfast cereal.



Providing nutritious, tasty and convenient breakfast cereals for **more than 36 years**



Selling in **120+** countries



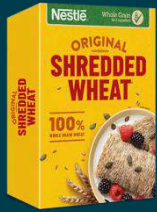
Over 3200 employees representing 80 nationalities



Sales of **CHF 1.4 billion** in **2025**



Where we've come from



1893

Shredded
Wheat

1941

Cheerios. Debut
of CHEERIOS OATS
as #1 RTE Oat
Cereal in US by
GMI

1951

Shreddies

1983

Uncle Toby's

1984

Chocapic
developed by
CPW and
launched in
France, Spain and
Portugal in 1991

1990

CPW founded

1991

Nesquik
by Nestlé

1994

Trix imported
from US and
localized in 1996

1996

Nescau.
Fitness launched
by CPW

1997

Cini Minis
launched by
CPW

Where we've come from



1997

Lion by CPW
First kids bars:
Chocapic, Golden
Grahams,
Nesquik

2004

Fitness bars

2015

Fitness granolas

2016

Family granolas

2017

Clusters granola
and bars

2018

Nesplus range
Bio range

2019

Country
crunch NAT

2020

NAT bears
Carlos V

2021

Cini minis
Churros
NAT honey
crunchies

2023

KitKat cereal

Better ingredients

Whole grain. Guaranteed



Whole grain is our main ingredient:

- We have chosen to have whole grain as the key differentiator and main ingredient of Nestlé Breakfast Cereals.
- Whole grain contains more fibers & nutrients than refined grains, making it an ideal component of a balanced breakfast and a great way to start the day.
- All our products carrying the green banner offer:
 - Whole grain as the No.1 ingredient
 - 8g whole grain per 30 grams



Our green banner shows our commitment to provide better breakfast.

‘Whole grain’ means that all parts of the native, edible grain are present:

- The bran
- The germ
- The endosperm

Each part delivers its own nutrition benefits.

Bran
Provides fibres, antioxidants, B vitamins and minerals

Endosperm
Provides carbohydrates, proteins and B vitamins

Germ
Provides proteins, vitamins B & E, magnesium and essential fats.



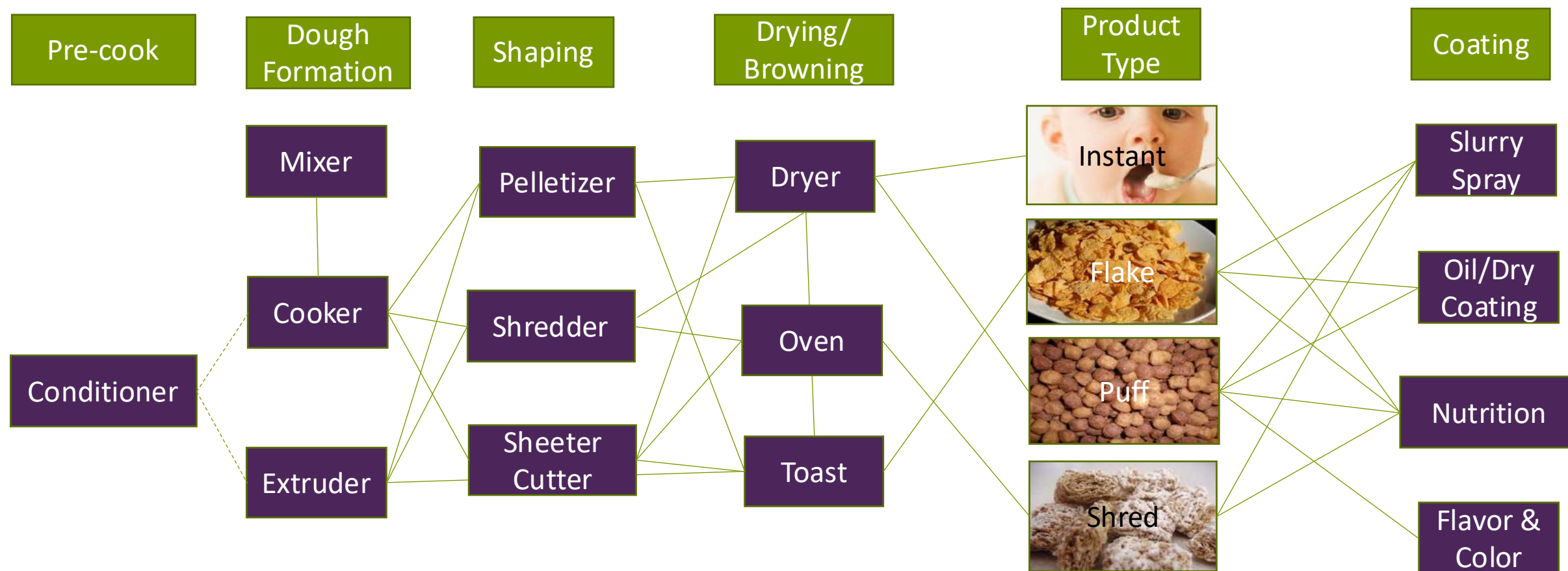
New Products & Initiatives



Ready to Eat (RTE) Cereal

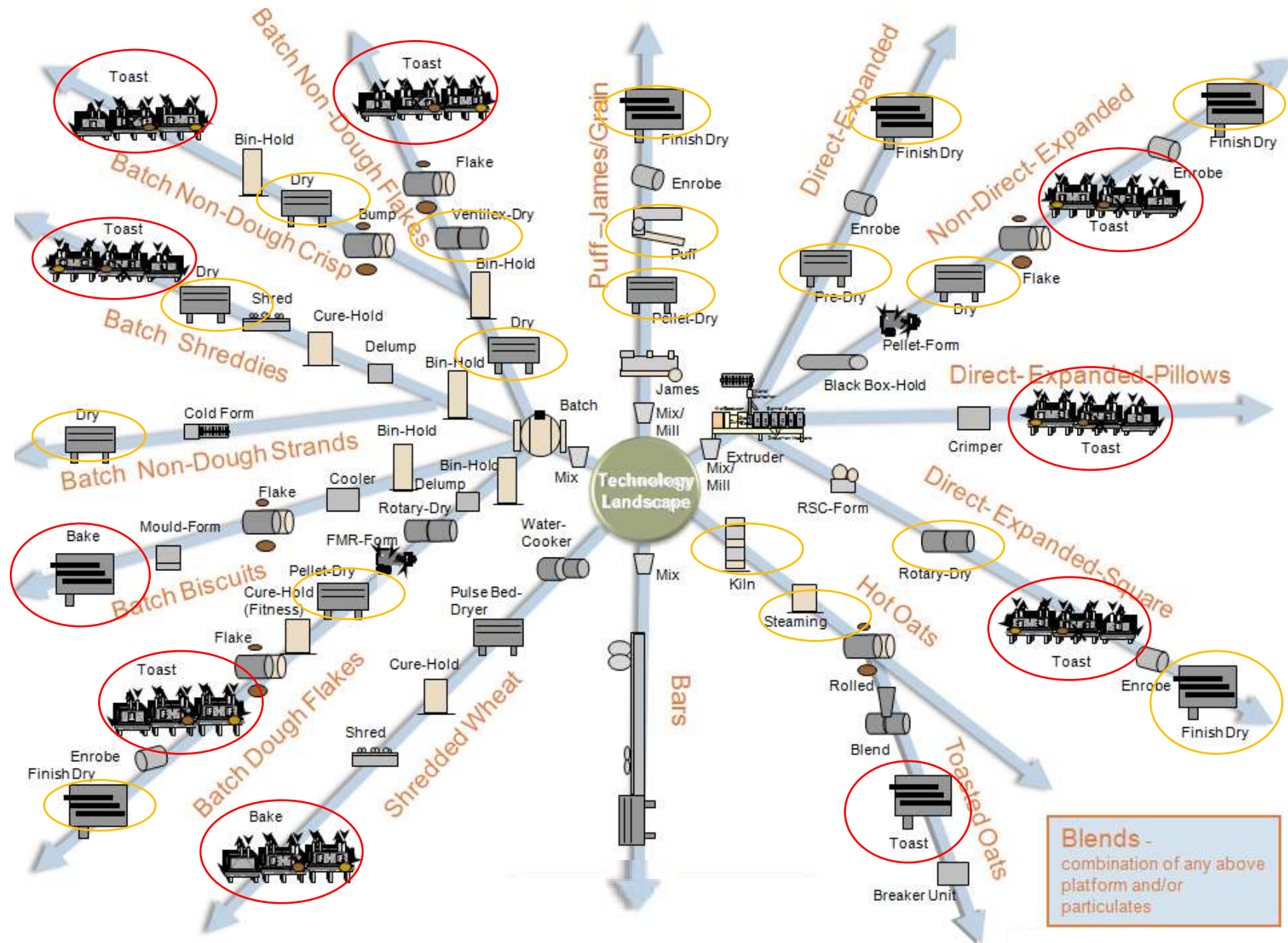
Grains typically used (by prominence)

Corn, wheat, rice, oats, barley, buckwheat, malted grains



Looks confusing, but think of it like a transit map...lots of ways to get from one side to the other

CPW technology platforms : current



Temp: 70-115°C
Moisture: 20-10%

Temp: 150-250°C
Moisture: 10-2%

Blends -
combination of any above
platform and/or
particulates



Cooking: Rate defining



- 200-1000kg batch
- Large Footprint
- Often >1 per line

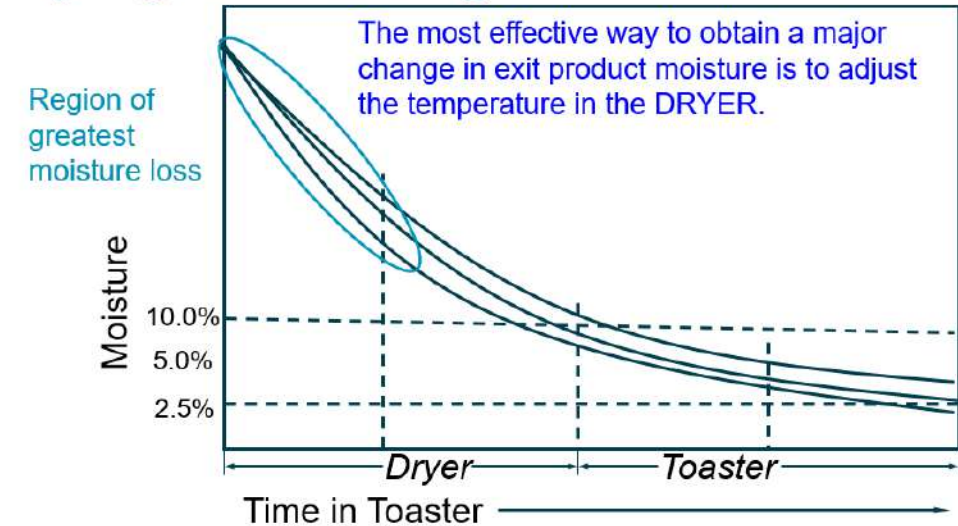


- 400-4000kg/hr
- Smaller footprint
- Usually 1 per line

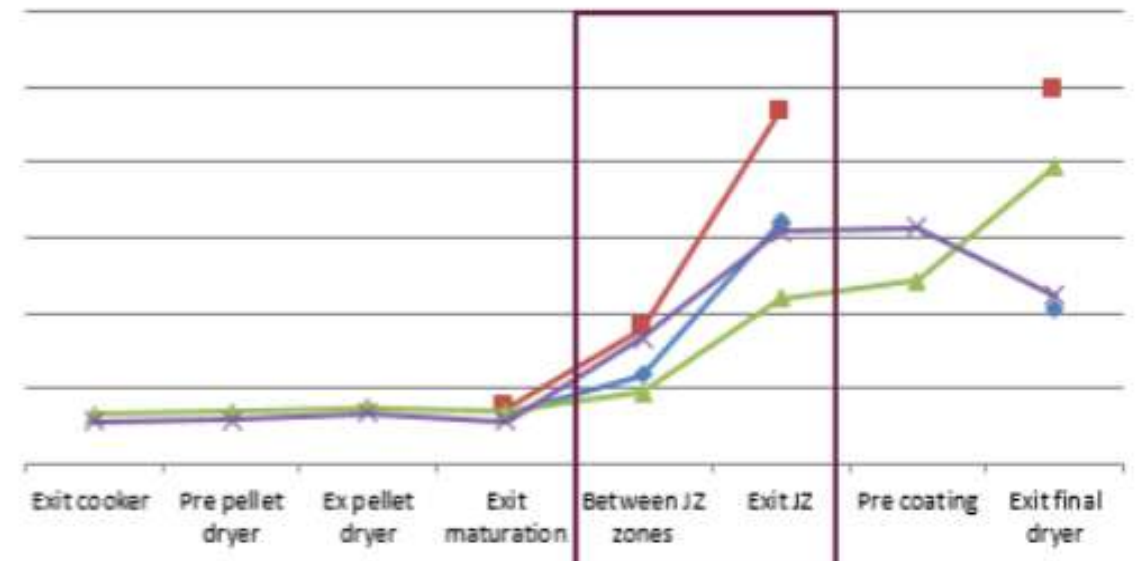
Main Control Point: Final Oven/Toaster

- Product recipes, ingredients, formulations change
- Manufacturing location and assets rarely change
- Product moisture is highly intuitive
- **Learnings and Key "Immune" Controls**
 - Moisture difference between Z1 & Z4 to be <7%
 - Moisture of product to be <6% before Z3
 - Centrelining by AA validation written into manufacturing SOP, requiring change approval by R&D

Drying & Toasting.



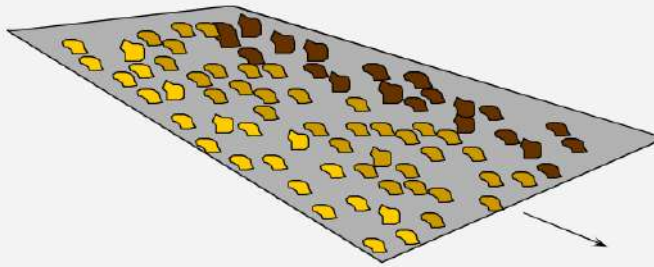
AA evolution (Flakes)



Manufacturing: Scale and Rates

Moisture & Maintenance

Darker pieces on one side of the pan



Usually caused by uneven product feed into toaster (heavy on lighter colored side)

Position	Sample Size	Mean	Standard Deviation
L	15	1.5053	0.08149
M	15	1.3767	0.11418
R	15	1.354	0.08887



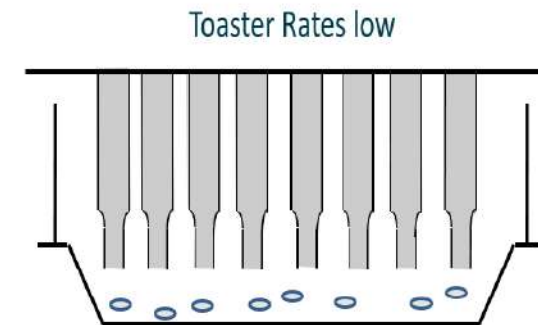
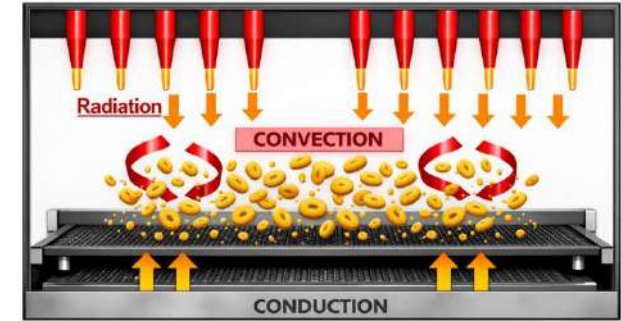
Sample	Sample Size	Mean	Standard Deviation
Moist L 55%	9	2.4933	0.07246
Moist M 55%	9	1.4911	0.12927
Moist R 55%	9	1.9633	0.07714

Moisture difference between left/middle/right of toaster width with increasing rates

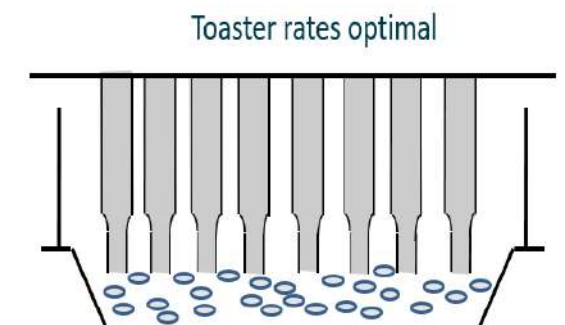
Manufacturing: Scale and Rates

Production of cereal manufacturing is not always stable

- Centrelined processes are when lines are stable
 - Settings, Moisture, AA is validated = v.predictable
- Unstable lines show moisture & acrylamide fluctuation 
- Most lines cannot instantly compensate for rate changes
 - Workarounds, e.g. dumping, buffer bins are costly and space limited
 - Temperatures drop slowly in large equipment



- Product surface exposure to heat (conduction & convection) is high
- Minimal operating temperatures of the Toaster is often above the required for product quality



- Product surface exposure to heat is lower, especially conduction heat
- Operating temperatures of the Toaster has more flexibility to increase/decrease

Acrylamide Mitigation

- Focus acrylamide control on **high-heat processes where moisture <10%**
- Consistent acrylamide levels achievable via **process monitoring, equipment capability and centrelining**
- Reformulation, sensory and dilution techniques mitigate AA but carry consumer trade-offs
- Raw material quality monitoring is effective
 - Multiple suppliers, grain variability and desire for wide specifications often make this a less preferred control



CPW – Cereal Bars

- We have a healthy business within bars, with presence in most EU markets
- We position them as an "on the go breakfast solution"
- They must contain our cereal component, and have a RTEC brand equity already in place
 - Key differentiator to Baked Cereal Bars



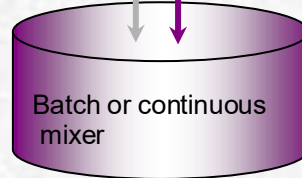
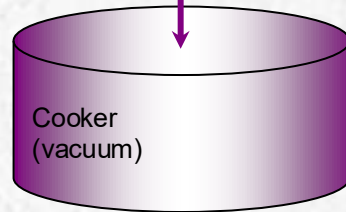
LION miniature Bar components vs RTEC pieces



BAR LINE TECHNOLOGY

Binder

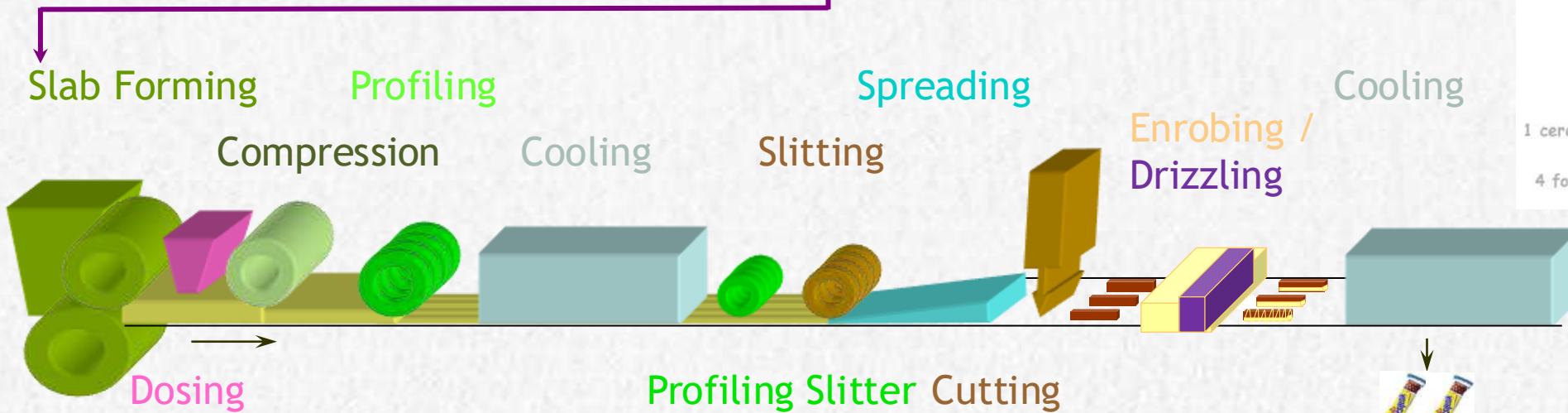
- Sugar
- Syrups
-
- Fats
- Emulsifiers
- Proteins
- Texturizer
- Humectants
- Micronutrients



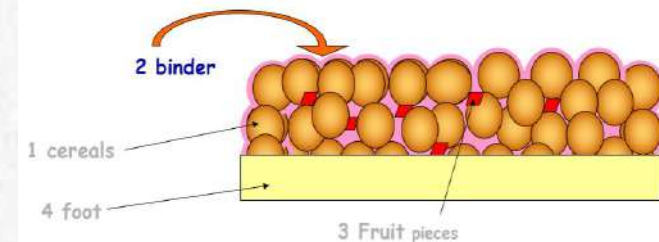
Mixing

- Cereals
- Non-extruded cereals
- Roller dried cereals
- Fruits

Dry mix



A cereal bar has up to 4 components...



Packaging



BML & ML - Impact Assessment

- **Global, optimised supply chain**
 - Product design, volumes & logistics and are optimised for this model
- **One Acrylamide datapoint ≠ full volume capability**
- Test and release or hold is possible, but not without high consequence
- **Confidence of compliance comes from data**
 - Historical & statistical data, controlled inputs → BML / ML compliance

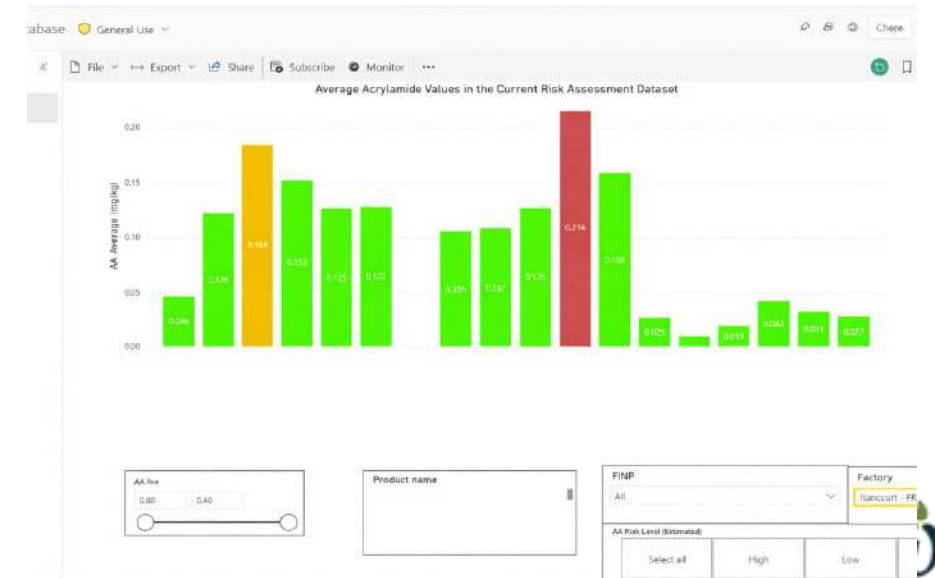


Monitoring & Control of AA

- CPW adopts EU acrylamide legislation as a benchmark as the global standard.
- **Annual analysis reporting** on compliance
- **Annual mandatory Acrylamide training** and mitigation awareness for all product personnel
- **Dedicated resources**, tools & monitoring visuals
- Continued R&D, Regulatory and Quality **dedication on ALARA.**

- AA risk level will be defined according to below.

Recipe risk level (evaluation by R&D and transferred through pHACCP)				
Risk Level	Low	Medium	High	Non-compliant
Risk definition for product Acrylamide value (AV)	AV are below benchmark levels – 3 standard deviations [[BML-3*STD]>AV]	AV are below benchmark levels – 2 standard deviations but higher than benchmark levels – 3 standard deviations [(BML-2*STD)>AV]>[(BML-3*STD)]	AV are below the benchmark levels but above benchmark levels – 2 standard deviations [(BML>AV]>[(BML-2*STD)]]	AV are above the benchmark level [[AV>BML]
Action to do during the development	No Action	No Action	Work on mitigation plan with Technical experts	Work on mitigation plan with Technical experts



BML and ML, Summary

- CPW continues to promote **breakfast cereals** as part of a **healthy, nutritious & balanced diet**
- CPW continues to be actively engaged in discussions on Acrylamide, using **data to refine and expound a voice** with CEEREAL, FDE and others
- We promote and encourage **more wholegrains in the diet** and **support the differentiated categorization of wholegrain & non-wholegrain products** to reflect the Acrylamide risk
- Cereal Bars can represent a diverse category
 - Large differentiation in processing, and composition, influences product identity, and Acrylamide
 - A single categorisation in legislation may not fully reflect this variance
- BMLs, as presently set, are **reflective of a challenging level of Acrylamide** for a diverse category of products
- The presence of BMLs, a focus on **consistent quality** and **compliance** should outweigh the requirement for rigid and reductionist MLs

Breakfast Cereals Benchmark Levels

Breakfast cereals (excl. porridge)	Benchmark level [µg/kg]
 bran and whole grain cereals	300
 wheat and rye ¹	300
 maize, oat, spelt, barley and rice ¹	150

¹ Non-whole grain and/or non-bran based cereals.
The cereal present in the largest quantity determines category.

