The Truth Behind Phosphate Chemical Leavening

Phosphates have been an integral part of chemical leavening systems since their discovery. The acid-base reaction with sodium bicarbonate to deliver carbon dioxide gas has supposedly been well known chemistry. But has it? Do we really understand the mechanisms behind the phosphate/bicarbonate reaction? An in-depth investigation has shown that phosphates cause bakeries significant technological challenges.

Bakeries often compensate for these difficulties by adding ingredients such as organic acids, starches, gums and emulsifiers.

So could there be new technology out there? This presentation looks at a new and novel means to deliver carbon dioxide with none of the drawbacks of phosphates, yet the same high quality results. This new technology produces nutritionally balanced baked goods that are low in sodium and phosphate free. Added salt can be removed, products become clean label and shelf life is controlled without affecting color, taste or texture; and we get the perfect rise!

Learning Objectives

- Understand the effect and limitations of phosphate leavening systems
- Understand the ingredients that are used to counteract the effects of phosphate addition
- Gain insight into a new and novel technology that rises baked goods without the use of phosphates

Presenter
Dinnie Jordan, Kudos Blends

Presentation Time
Tuesday, February 26, 2019
1:25 pm - 2:00 pm

Session
Breakout 5
THE TRUTH BEHIND PHOSPHATE CHEMICAL LEAVENING

Dinnie Jordan – MD, Kudos Blends
26th February 2019

DEVELOPMENT AND PROGRESS COME FROM A HUNGER FOR CHANGE
A SPARK OF INSPIRATION
5 YEARS IN THE MAKING

PERCEIVED WISDOM DRIVES BEHAVIOUR...

- pH
- Sugar Content
- Shelf Life
TRADITIONAL CHEMISTRY

Industry assumed...

\[
\text{SAPP (Acid)} + 2 \text{ Bicarbonate (Base)} \rightarrow 2\text{CO}_2 + 4\text{SP}
\]

Carbon Dioxide (Leavening gas)
Tetrasodium Pyrophosphate (Reaction salt)

PERCEIVED WISDOM DRIVES BEHAVIOUR
SAPP CHEMISTRY DOESN'T MAKE SENSE

\[
\text{HO--P--O--P--OH} \\
\text{ONa} \quad \text{ONa}
\]

Active

In-active

SAPP CHEMISTRY DOESN'T MAKE SENSE

\[
\text{HO--P--O--P--OH} \\
\text{ONa} \quad \text{ONa}
\]

Active

In-active
WE HAVE DISCOVERED THE **ACTUAL MECHANISM IS**

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**Soda & SAPP Reaction**

**KNOWLEDGE DRIVES UNDERSTANDING**

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**pH to 7.5**
Neutralising Value

KNOWLEDGE DRIVES UNDERSTANDING

WHAT WE THOUGHT

Rate of Reaction

DROR (Dough Rate of Reaction) Comparing Two Concentrations of SAPP 40 and Two Reaction Temperatures
BECOMING WISE BAKERS

Control

200% SAPP

Reduced soda and reduced deposit weight

PERCEIVED WISDOM DRIVES BEHAVIOUR...

pH

Sugar Content

Shelf Life
MAGIC INGREDIENTS

Polyvalent cations

NEW CHEMISTRY

100% gas is released

Any pH with all the functionality of SAPP
FROM THEORY TO ACTION

- **pH**
  - Achieve any pH without compromising taste, volume and texture

- **Sugar Content**
  - Achieve sugar reduction without affecting shelf life

- **Shelf Life**
  - Make preservatives more effective or remove them entirely

SO WHAT IS THE IMPACT?
**SUGAR REDUCTION**

Today’s challenge

Tomorrow’s opportunity

-20% by 2020

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**SHELF LIFE**

Today’s challenge

Tomorrow’s opportunity

X DAYS  Y DAYS
REVOLUTIONISE THE BAKING INDUSTRY

**Health Benefits**
- Sugar reduction
- Sodium reduction

**Quality Improvements**
- Maintain eating qualities
- Shelf life changes

**Cost Reduction**
- Reduce preservatives
- Remove extra ingredients

WE’RE ON THE CUSP

KUDOS BLENDS’ HUNGER FOR CHANGE
Kudos Blends is seeking patent rights to protect its new and novel leavening system via patent application number WO 2017/021018 A1.