



Deliver the premium  
promise with  
**COBAO™ Pure**

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AAK – The Co-Development Company

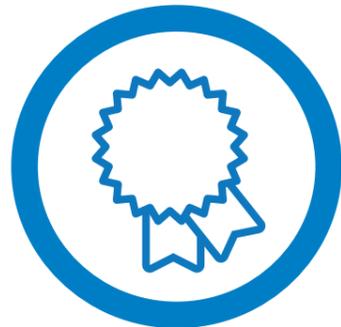
**AAK**

# Deliver the premium promise with **COBAO™ Pure**

## Extend the shelf life of your premium chocolate

The premium chocolate market is forecast to grow three times faster than the standard chocolate segment. As more consumers buy chocolate confectionery as a luxury indulgence rather than an everyday snack, the number of premium product launches is on the rise. Consumers increasingly demand unique products with a stamp of

natural authenticity. One of the biggest pains for industrial producers is how to deliver chocolate with a premium appearance – in other words, without bloom. Maintaining the appeal of the premium chocolate through extended shelf life without altering the label is a challenge.



**X3**

premium segment growth compared to standard chocolate



**69%**

of consumers say product labels influence their purchasing behavior

AAK has developed a solution: **COBAO™ Pure**



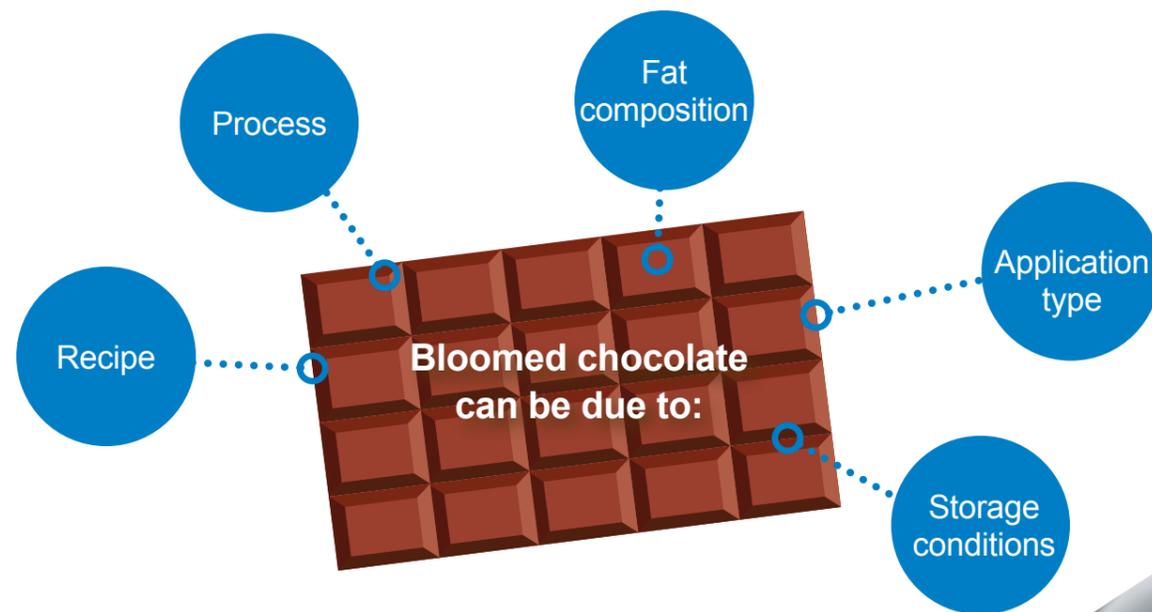
# Protect your premium chocolate

Chocolate bloom is often an underestimated challenge in the chocolate industry, with few possibilities for manufacturers to calculate loss of sales and goodwill related to bloom damage.

Storage temperatures are beyond control once products have left the factory. So it is important for producers to have a process that minimizes the effect of temperature fluctuations.

Special cocoa butter equivalents (CBEs), emulsifiers and milk fat can all be used to increase bloom stability.

But there are several drawbacks. All these ingredients must be declared on product labels. In addition, manufacturers must comply with regulations governing the level of vegetable fats such as CBEs and CBIs allowed in chocolate recipes. Milk fat also has a significant softening effect which alters the sensory profile, even when used at very low levels in dark chocolate.



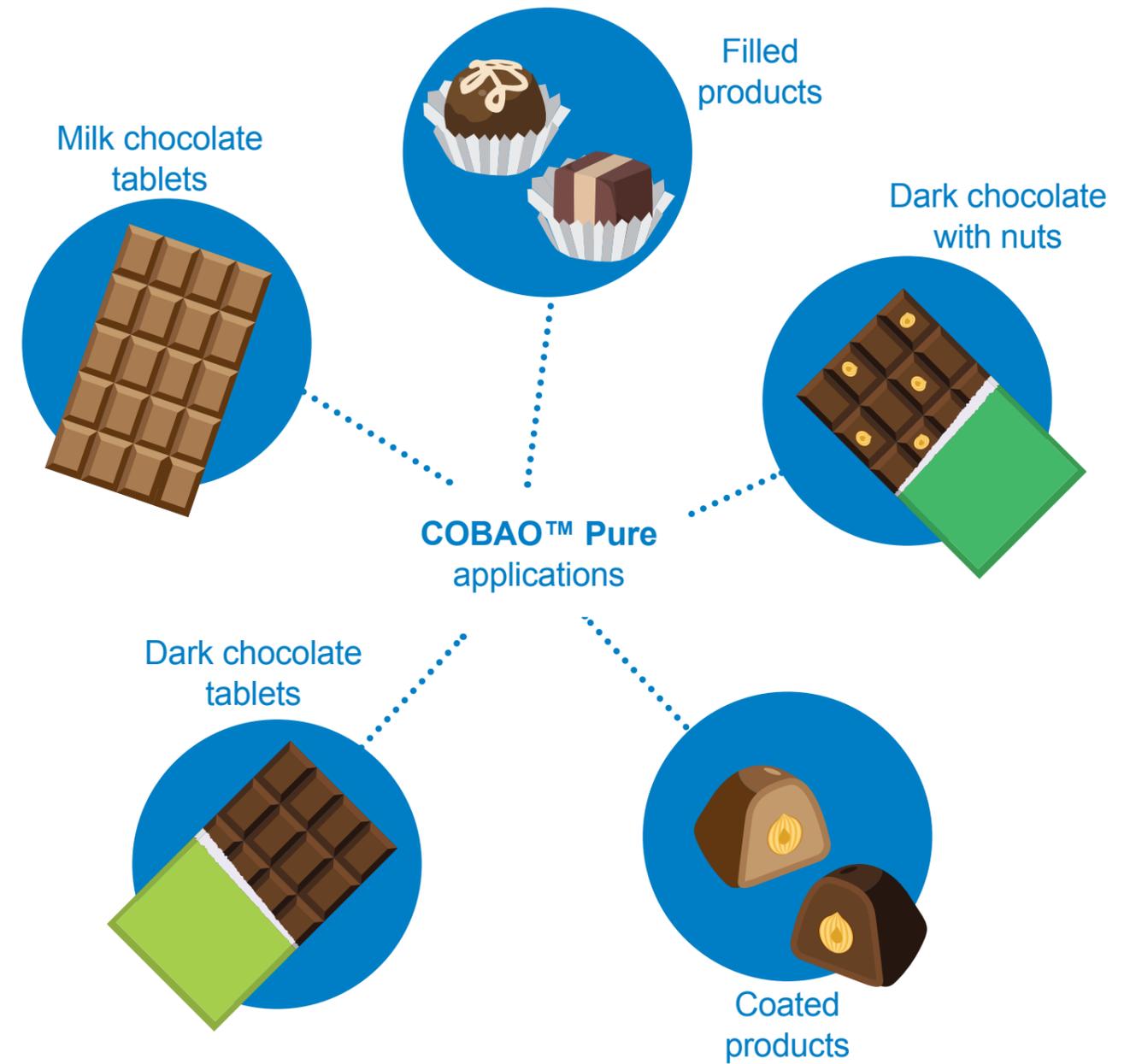
## High expectations of shelf life

There are some key considerations when delaying the development of unappealing bloom **without**:

- ◆ Altering sensory characteristics
- ◆ Compromising quality
- ◆ Changing the labeling
- ◆ Adding allergens



**COBAO™ Pure** prevents bloom in solid bars, products with nuts as well as in filled products



# COBAO™ Pure enables you to keep your brand promise



Extended shelf life

- ◆ COBAO™ Pure retards migration and heat-related bloom
- ◆ Maintain appealing surface
- ◆ Expect 50 – 400% longer shelf life, depending on recipe, processing and application



No sensory changes

- ◆ COBAO™ Pure has no impact on sensory properties compared to adding milk fat in order to expand the shelf life
- ◆ Less softening effect than milk fat



Lactose free

- ◆ COBAO™ Pure meets the lactose and dairy-free consumer trend
- ◆ No added allergens such as milk fat



No changes in labeling

- ◆ COBAO™ Pure is label neutral
- ◆ Labeled as cocoa butter



Global reach

- ◆ COBAO™ Pure is less sensitive to variations in storage and distribution conditions

## What is COBAO™ Pure?

- ◆ COBAO™ Pure is a fully deodorized Pure Prime Pressed cocoa butter, as defined by EU legislation
- ◆ COBAO™ Pure has excellent functional properties, **significantly delaying the onset of bloom** in chocolate products
- ◆ COBAO™ Pure is **fully compatible** with all types of cocoa butters





Extended shelf life

# Shelf life extension with COBAO™ Pure

Bloom is probably the biggest issue most producers have when working with chocolate. Particularly storage conditions are very tough to control. **COBAO™ Pure** retards migration and heat-related bloom.

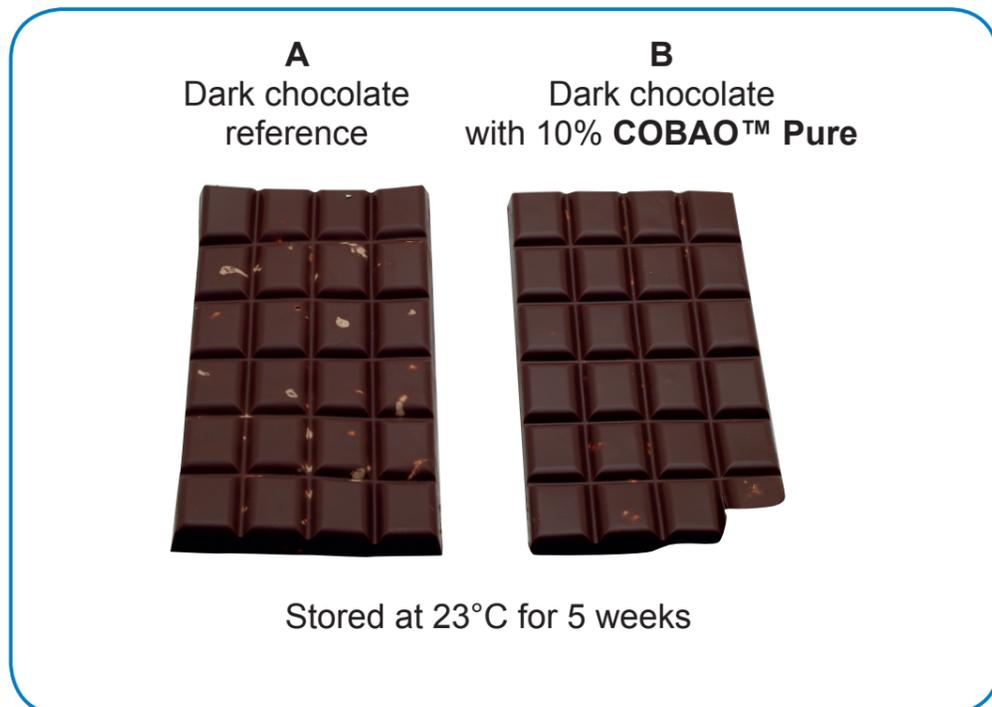
## The impact of storage temperature

Chocolate tablets containing whole or broken hazelnuts, almonds or peanuts are a common application, where bloom is the manufacturer's worst enemy. Part of the problem may be that the nuts are too cold when used. But, even when the storage temperature is raised slightly, bloom may still develop rapidly in a high quality chocolate.

Two dark chocolate recipes were tested. Both contained 10% hazelnuts and were stored at 23°C for 5 weeks respectively. Recipe B contains 10% **COBAO™ Pure** (figure 1). The results show bloom retarding effects on the tablet which contains **COBAO™ Pure** compared to the standard.

Comparison between tablets stored at 23°C for 5 weeks

Figure 1



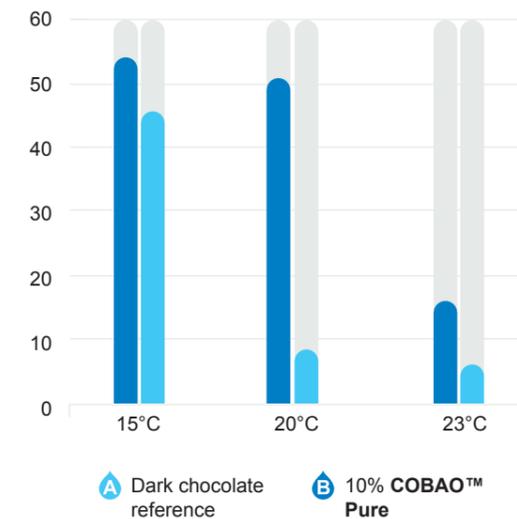
Recipe A: 42% cocoa mass, 10% cocoa butter, 47.6% sugar, 0.4% lecithin, total fat: 33.5%.  
Recipe B: 42% cocoa mass, 10% COBAO™ Pure, 47.6% sugar, 0.4% lecithin, total fat: 33.5%.

Storage conditions have such a high impact on bloom development that even a dark or milk chocolate tablet without filling or nuts will rapidly show signs of bloom when

the temperature increases just a few degrees above room temperature. If the storage temperature fluctuates up and down, bloom will develop even faster.

## Improving shelf life and reducing temperatures sensitivity in dark chocolate

Weeks before bloom



The speed of bloom development is closely linked to storage temperature. The bloom stability of the tablets in figure 1 was tested at three isotherm temperatures in controlled cabinets. The results are shown in figure 2.

Figure 2 shows the correlation between bloom development and storage temperature for recipes A and B.

It is clear that the addition of 10% **COBAO™ Pure** improves shelf life and reduces sensitivity to a higher storage temperature significantly.





Extended shelf life

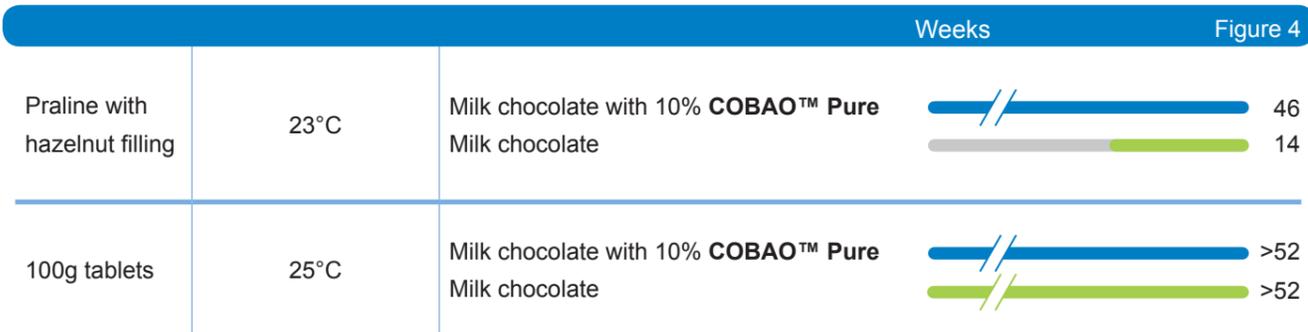
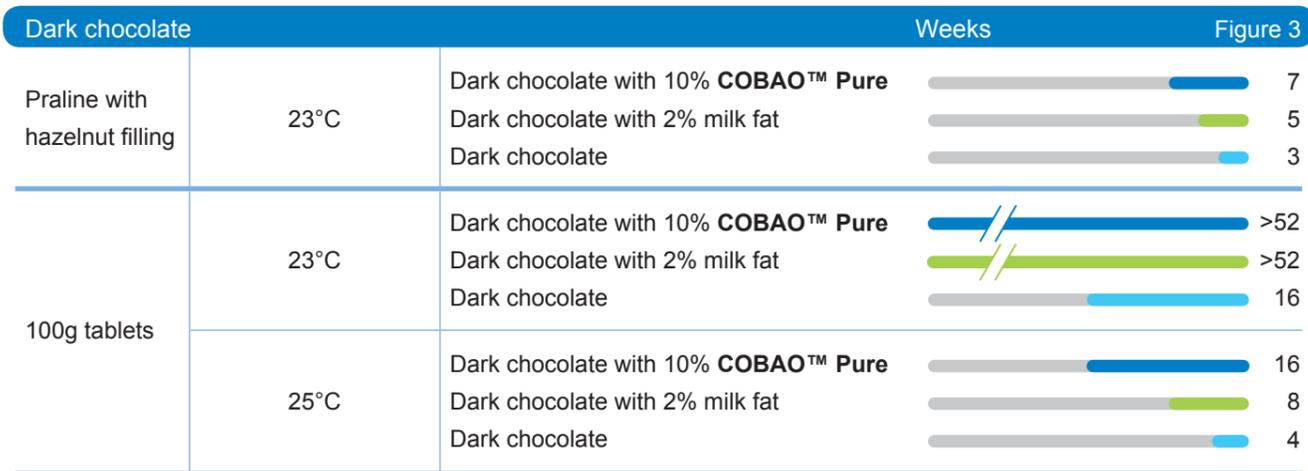
# COBAO™ Pure outperforms milk fat as shelf life extender

Bloom development can be postponed in a range of applications and recipes by adding **COBAO™ Pure** or milk fat.

Figures 3, 4 and 5 show that the shelf life and bloom stability of dark chocolate change significantly when 10% standard cocoa butter is replaced with 10% **COBAO™ Pure**.

This makes **COBAO™ Pure** an ideal solution for dark chocolate applications as the sensory profile is unchanged and shelf life improved.

**COBAO™ Pure** is an effective way to protect chocolate from bloom in elevated storage temperatures. Depending on the dose of **COBAO™ Pure**, it is possible to minimize the negative effect of excessive heat during transport for several days or a high storage temperature during the summer.



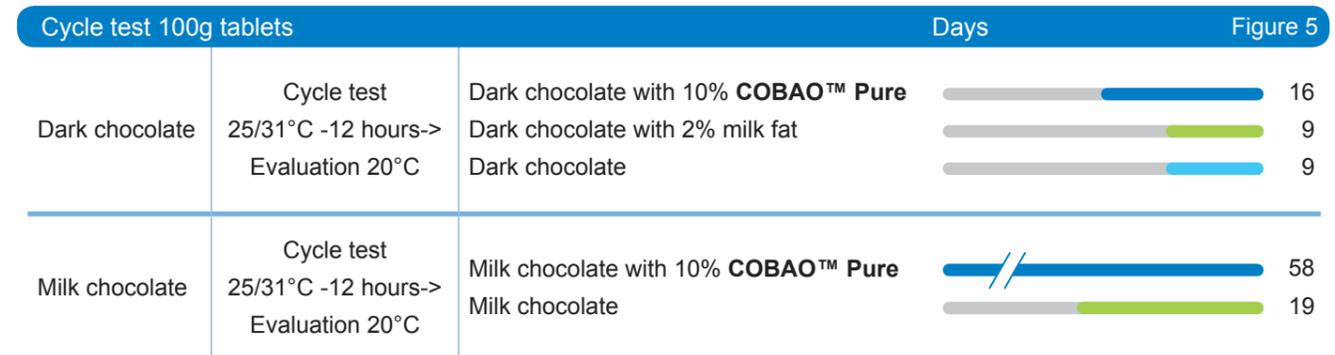
The bloom stability of the tablets was tested at three isotherm temperatures in controlled cabinets.

### Recipes

Dark chocolate with 10% COBAO™ Pure: 42% cocoa mass, 10% COBAO™ Pure, 47.6% sugar, 0.4% lecithin, total fat: 33.5%.  
 Dark chocolate: 42% cocoa mass, 10% cocoa butter, 47.6% sugar, 0.4% lecithin, total fat: 33.5%.  
 Dark chocolate with 2% milk fat: 42% cocoa mass, 8% cocoa butter, 2% milk fat, 47.6% sugar, 0.4% lecithin, total fat: 33.5%.

Milk chocolate with 10% COBAO™ Pure: 39.6% sugar, 20% whole milk powder, 9% cocoa butter, 10% COBAO™ Pure, 16% cocoa mass, 5% skimmed milk powder, 0.4% lecithin, total fat 33.2%.  
 Milk chocolate: 39.6% sugar, 20% whole milk powder, 19% cocoa butter, 16% cocoa mass, 5% skimmed milk powder, 0.4% lecithin, total fat 33.2%.

Hazelnut filling: 38% sugar, 30% fat (CHOCOFILL™ NH 50), 17% hazelnut paste, 6% whole milk powder, 5% skimmed milk powder, 4% cocoa powder, total fat 43.2%.





No sensory changes

## Unchanged sensory profile

### Sensory properties

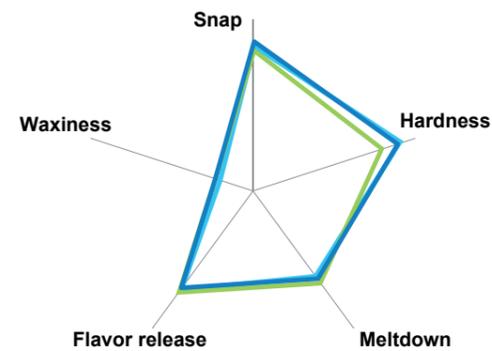
The sensory attributes of chocolate are determined by several variables, including the recipe.

When 2% cocoa butter is replaced by milk fat the sensory profile changes significantly, reducing the hardness and snap.

The replacement of 10% cocoa butter with 10% **COBAO™ Pure** has no significant effect on the sensory profile of dark chocolate.

This makes **COBAO™ Pure** an ideal solution, especially for challenging dark chocolate applications. The sensory profile is unchanged and shelf life improved.

Unchanged sensory profile Figure 6



- Dark chocolate, 10% **COBAO™ Pure**
- Dark chocolate, 2% milk fat
- Dark chocolate

## Less softening effect than milk fat

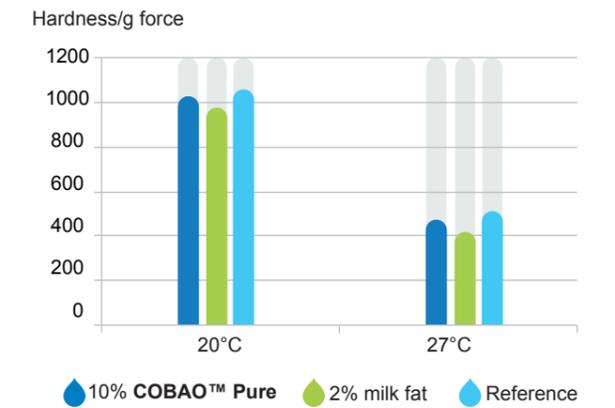
### Comparison of hardness

Figures 7 and 8 compare the hardness of dark chocolate products stored for one week at 20°C and 27°C.

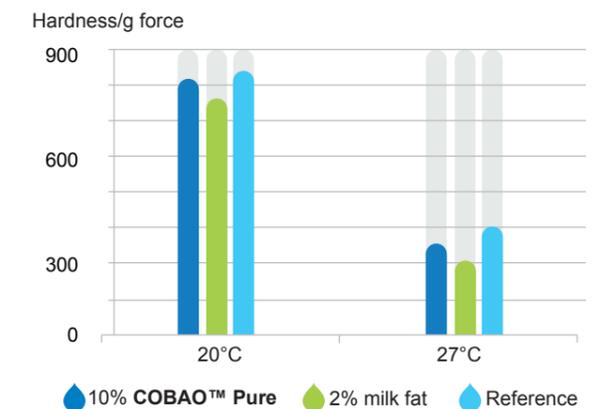
At a storage temperature of 20°C, the hardness of dark chocolate with 30% fat is relatively unchanged when 10% cocoa butter is replaced by 10% **COBAO™ Pure**. The dark chocolate with 2% milk fat, on the other hand, is significantly softer. Recipes with milk fat soften significantly more than recipes with **COBAO™ Pure**.

The figures show that a higher fat content reduces the hardness of the chocolate. However, the impact on hardness at 20°C is lower when 2% milk fat or 10% **COBAO™ Pure** is added.

Dark chocolate 30% fat Figure 7



Dark chocolate 34% fat Figure 8





Lactose free

## Lactose free solution with **COBAO™ Pure**

The health and wellness trend has taken the issue of food intolerances and allergies to the top of consumer minds. This means a growing number of consumers are resorting to lactose-free and dairy-free products as a lifestyle choice. The addition of milk fat is a widely used solution in the industry to delay bloom.

For consumers who are lactose intolerant, the use of milk based ingredients to extend the shelf life of chocolate, including dark chocolate, is a problem. Some experience symptoms, after consuming only a tiny amount of lactose. But for most consumers, the reason for avoiding lactose is of personal convictions. So, to meet the premium promise, the confectionery industry needs solutions fitted to this trend.



**20% of consumers in Germany say they avoid dairy products**

Source: Mintel 2018

There is no need to declare **COBAO™ Pure** separately on product labels. The final product is free of added allergens, such as milk fat, and sensory properties are not compromised.



No changes in labeling

## No changes in labeling



**69% of consumers say product labels have an impact on their purchasing behavior**

Source: C+R research, your guide to the clean label revolution, 2017

With regard to labeling requirements, emulsifiers such as STS and milk fat may be used. However, there are several drawbacks. All these ingredients must be declared on product labels. This makes it complicated for the manufacturers.

Among consumers, there is a growing demand for fewer ingredients on product labels. Consumers are increasingly focused on the ingredients in the products they buy and read labels carefully. **COBAO™ Pure** is a label-neutral solution that meets consumer expectations.



Global reach

## Overcome distribution challenges and extend your product's reach

### COBAO™ Pure extends your global reach

Consumer purchasing habits have changed dramatically since the arrival of online shopping. Today, consumers shop where they want, when they want. For online retailers, this represents an opportunity and a challenge. The opportunity is to extend their geographical reach to new, unexplored markets. The challenge is to manufacture products that can tolerate varying conditions during distribution from factory to consumer.

**COBAO™ Pure** gives manufacturers of chocolate confectionery this global reach. By offering natural protection against bloom, **COBAO™ Pure** keeps chocolate quality

stable, even in the face of fluctuating temperatures during transport and storage. So, when a delivery arrives on consumer doorsteps, the confectionery inside is just as indulgent and appealing as when it left the production line.

**COBAO™ Pure** supports confectionery distribution to markets anywhere in the world – to those where the logistics infrastructure is less developed and others where advanced technology will soon enable unmanned delivery by driverless robot or drone.

## Deliver the premium experience and keep your brand promise

**COBAO™ Pure** is an efficient bloom retarder based on 100% cocoa butter. This means there is no need to declare it separately on product labels. Compared to milk fat, it has very little impact on the sensory profile of the final chocolate.

The effect of **COBAO™ Pure** is strongly linked to the recipe, application and process. A chocolate that is not well tempered or cooled will always be difficult to protect against bloom development. However, under optimal processing conditions, the shelf life of dark and milk chocolate can be significantly improved.

**COBAO™ Pure** is most efficient against bloom caused by a high storage temperature. Using it, you can overcome distribution challenges in the new retail future.

This makes **COBAO™ Pure** the best solution for bloom prevention in all chocolate applications, where a clean label, improved shelf life and consistent sensory properties are a must.



### With COBAO™ Pure you get:

High quality products

Long shelf life due to extended bloom stability

Fewer recalls

No extra labeling requirement

Unchanged sensory profile



## We are AAK

AAK is a leading provider of value-adding vegetable oils & fats. Our expertise in lipid technology within foods and special nutrition applications, our wide range of raw materials and our broad process capabilities enable us to develop innovative and value-adding solutions across many industries – Chocolate & Confectionery, Bakery, Dairy, Special Nutrition, Foodservice, Personal Care, and more. AAK’s proven expertise is based on more than 140 years of experience within oils & fats. Our unique co-development approach brings our customers’ skills and know-how together with our own capabilities and mindset for lasting results. Listed on Nasdaq Stockholm and with our headquarters in Malmö, Sweden, AAK has 20 different production facilities, sales offices in more than 25 countries and more than 3,400 employees.



We are AAK – The Co-Development Company.

