## SCI LECTURE PAPERS SERIES

# CHOCOLATE, CHOCOLATE FATS AND THE NEW EU CHOCOLATE DIRECTIVE: IMPLICATIONS FOR CHOCOLATE MANUFACTURERS IN EUROPE

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## Introduction

Chocolate is one of a small number of foods that is covered by "vertical" legislation. This legislation gives compositional standards for products under the reserve description and some labelling requirements for the particular product. Reserve descriptions are given for a number of products, including chocolate, milk chocolate and white chocolate and also cocoa products.

When the UK, Denmark and Ireland joined the European Economic Community, issues were raised because of the different chocolate standards these countries had in relation to the existing member states.

The main contentious issues were

- The minimum amounts of milk and cocoa solids and how these products were labelled.
- The use of non-cocoa vegetable fats and the labelling implications.

Every chocolate manufacturer from the various countries would want standards that would benefit them. For consumers it was about having choice and still being able to have the products that they liked and had grown up with. The issues were difficult to resolve and became very political. In some ways the issues were made more difficult by inaccurate reporting in the press. Over the years there have been many reports that have confused the issues, for example, saying that if vegetable fat was used in chocolate the product would have to be called "Family milk chocolate". Would the average consumer really know, understand – or care about the difference?

## **Compositional requirements**

In order to understand the "vertical" legislation it is important to understand the basics of compositional requirements.

#### Cocoa solids

Total cocoa solids = sum of non-fat cocoa solids and cocoa butter.

It is important to remember that total cocoa solids includes the natural fat from the cocoa bean, the cocoa butter. When looking at milk chocolate, the milk components are also important.

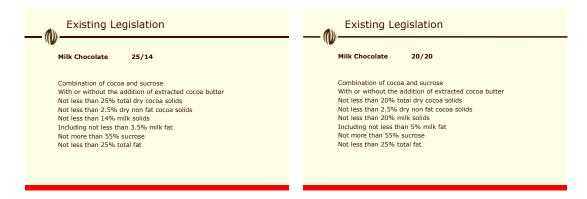
#### Milk solids

Total milk solids = sum of non-fat milk solids and milk fat (butter oil).

The legislation gives the intention that milk components should be added in their natural proportions.

### Milk chocolate

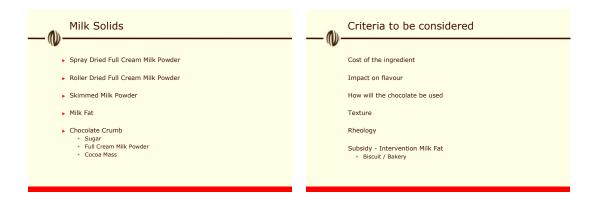
In legislation there are two sets of rules for milk chocolate – the 25:14 and 20:20 rules.



In the 20:20 milk chocolate, at the legal limits, there is less cocoa and more milk present. In practice, however, there are a lot of products that actually meet both sets of legislation. Which of these products is better? To me there is not a simple answer. Each has its merits. The way we view products tends to come from familiarity. There are clear differences in the taste of milk chocolate from different countries. These differences and the associated prejudices have been the major problem.

In designing a milk chocolate formulation it is important to understand where variations in flavour come from. Obviously, the source and quantity of cocoa is key, along with the particle size and the process conditions. For milk chocolate, the type of milk solids used is crucial in determining the flavour of the end product.

The source of the milk solids gives a different flavour and contributes to the performance of the product.



By using different milk components, a product can be made for a particular application, for example, using a higher level of milk fat can give a softer cutting milk chocolate.

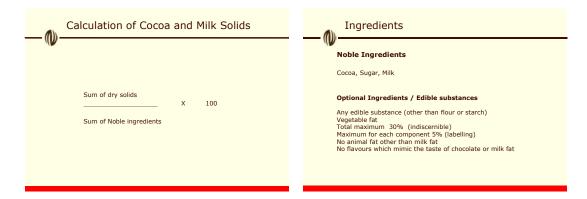
Lets look at a UK style milk chocolate and compare it to one from Belgium.



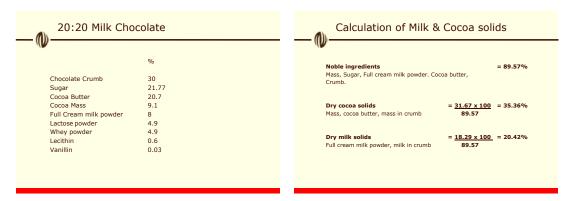
These recipes give products with very different taste profiles. When the recipes are compared from the legal aspect, there are only small differences between them.



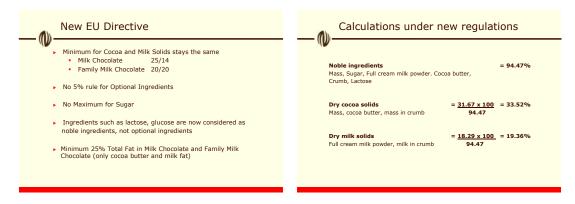
Both of these products could be a 25:14 or 20:20 milk chocolate. The calculation of the milk and cocoa solids is done on a dry basis – moisture content of the ingredient is deducted for the calculation. In the calculation it is fundamental to understand the concept of the "chocolate" part of the product – the so-called "noble" ingredients.



As well as the noble ingredients, other edible substances can be added. The calculation of the dry milk and cocoa solids is done as a percentage of the noble ingredients. If, for example, whey powder is added as an optional ingredient, the whey powder itself, although derived from milk, does not contribute towards the sum of the milk solids.. Let's look at an example:



The recipe contains chocolate crumb. All the components of chocolate crumb are noble ingredients. Summarized on the next slide are the most important changes with the new



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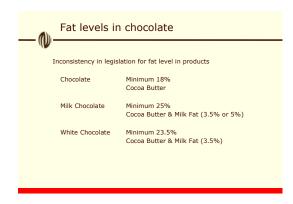
EU directive in relation to milk chocolate.

When the calculations are done under the new rules, because lactose is no longer considered an optional ingredient, the product is no longer legal as a 20:20 milk chocolate. In order to meet the new legislation, a slight change in formulation would be needed, which could have implications on price. To complete the section on milk chocolate, the last slide summarizes the main changes in labelling requirements under the new directive.



# The use of vegetable fat in chocolate

The other main contentious issue has been in relation to the use of non-cocoa vegetable fat in chocolate. Legislation gives minimum levels of fat in chocolate products. There appears to be little logic in this, as the fat levels are different for chocolate, milk chocolate and white chocolate.

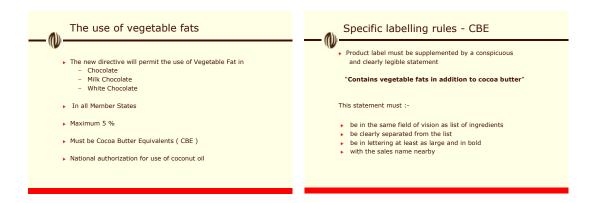


It is difficult to understand why the minimum for chocolate is 18%, as it is not possible to make a product at this very low level of fat.

Other than compositional requirements, why is the fat phase important? Chocolate is effectively a suspension of solid particles distributed in a fat phase.



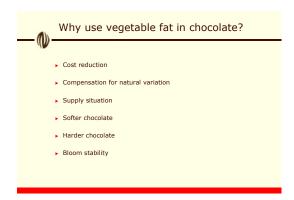
The new directive will permit the use of vegetable fats in chocolate products in all member states subject to certain criteria and labeling requirements. The legislation is specific to chocolate and chocolate products and introduces new labelling requirements.



Claims on the absence of vegetable fats are authorized but care should be taken with the wording used. In some countries initiatives have been taken, for example in Belgium, with the introduction of the Ambao label. In October 2000, the Belgian Minister of Economy registered the Ambao label. The Belgian government entrusted the brand name and management to the Traditional and Quality Chocolate Association. Several criteria have to be met to use the Ambao brand, one of which is that the product should contain no non-cocoa vegetable fat.

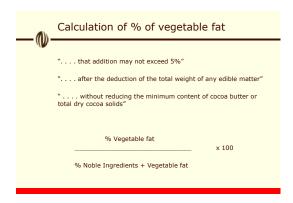
Why have vegetable fats been used?

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A key driver in potential use of vegetable fat is the cost of cocoa ingredients, in particular cocoa butter. Changes in cocoa butter prices due to market fluctuations and changes in ratios, gives attractive cost saving opportunities for introducing vegetable fat into chocolate products within the legal limits, to replace cocoa butter. Also important is the actual product. If chocolate is used as an ingredient to make another product, the labelling requirement for the additional statement "contains vegetable fat in addition to cocoa butter" is not needed. However, it is recommended that the presence of vegetable fat in the chocolate is made clear in the ingredients list.

Even within the new directive the calculation of the percentage of vegetable fat in the chocolate is not clear. It appears to treat the vegetable fat as an addition and also as an ingredient. The generally accepted method of calculation is shown below:



Care needs to be taken to ensure the new directive is met and existing recipes containing vegetable fat may need to change because of this new method of calculation. Another consideration in the recipe formulation of milk chocolate is the total fat%. In existing regulations, as mentioned earlier, there is a minimum total fat content of 25%. This is currently the sum of all the fats present. In the new directive the minimum total fat percentage stays at 25% but can only be the sum of the cocoa butter and milk fat, expressed as the percentage of the noble ingredients. This has an impact for low fat formulations, as significantly less than 5% of vegetable fat can actually be added.

# **Summary**

Flavour variation in milk chocolate is achieved by use of different ingredients and process parameters, not from the inclusion of vegetable fats. The new directive will certainly have an impact on chocolate producers in Europe.

Formulations of chocolate products, will need to:

- increase the level of milk solids
- change from lactose to whey powder
- increase percentage of whey powder
- maximize sugar addition.

Packaging changes will be needed:

- to meet labelling legislation
- to include a different ingredient list
- for "Family" milk chocolate
- to include an additional statement when vegetable fat is used.

Increased use of vegetable fats in chocolate will be seen to achieve cost reduction.

Recipes will change to reduce the level of vegetable fat addition, due to the new method of calculation.

Internal complexity will increase to handle different vegetable fats.