II Seminário de Corantes Naturais para Alimentos
I Simpósio Internacional de Urucum

ANNATTO ON THE EUROPEAN MARKET

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Chr. Hansen's Laboratorium Danmark A/S

1. INTRODUCTION

The colours derived from the annatto seeds are some of the oldest natural food colours known on the European market.

Annatto colours have a history since the 1870'ties in Europe, much longer than other food colours (synthetic as well as natural).

The production of annatto colours has, during the last decade, moved from Europe to the countries where the crops are grown. Where formerly the seeds were imported to Europe, the trend is that concentrated colour products like bixin or norbixin powder are now being imported.

Chr. Hansen's Laboratory, which I represent, is an exception because production from seeds is still taking place in Copenhagen, Denmark.

Since the foundation in 1874 Chr. Hansen's Laboratory A/S has produced annatto colours in Copenhagen, Denmark, Chr. Hansen's furthermore process annatto seeds in Milwaukee, USA, in Reading, United Kingdom and here in Brazil at our Brazilian company "HA–LA" do Brasil in Campinas.

The trend in Europe, however, is that more and more of the annatto colours are imported in the form of powders.

Although annatto is a well known and well established colour on the European market it is subject to heavy competition from other colours like- β-carotene and paprika.

2. APPLICATIONS OF ANNATTO ON THE EXISTING MARKET

First of all, let us look at the use of annatto in the past and how it has developed until now.

The commercial production of annatto colours that started in USA and Europe in the 1870ies was solely for the butter and cheese industry. Old names, like "buttercolour" and "cheesecolour", always refer to the traditional use of bixin and norbixin, respectively.

Other applications of annatto in food increased rapidly in the 1960ies, when some synthetic colours were banned.

Major applications of annatto include cheese, meat, fish, ice-cream, confectionery, dressings, snack foods and sauces. The main applications vary from country to country first of all because of different food traditions.

As an example it can be mentioned that approximately 60% of all annatto in Denmark is used in the meat industry mainly for colouring of sausage casings.

The use of annatto in butter and margarine has decreased during the last ten years in Europe. Butter is almost not coloured any more, and margarine is very often coloured by β-carotene.

The main application of annatto in Europe is in cheese. Norbixin sticks' to the casein molecules in milk and is thereby stabilized. It is this unique property of the annatto colour that creates the deep orange hue in cheddar cheese and cheese wax.

The 3rd slide the use of annatto in the United Kingdom, which is the largest market for colours in Europe (2).

As you can see, up to 70% of all annatto is used in cheese production. This picture also holds true for France, the largest producer of cheese in Europe.

In West Germany, however, most cheese is coloured with β-carotene, because of the restrictive legislation.

Cheese production in Europe has grown steadily since 1963 at a rate of 3-5% per year, which, however, now seems to slow down (1). Because the amount of coloured cheese is quite constant the use of annatto is foreseen to follow the same slowing down trend.

Before discussing the possibility of increasing the use of annatto in Europe in the future one must take a look at the market situation.

3. MARKET SIZE AND STRUCTURE

It is very difficult to estimate precisely the market and especially the market for different annatto types because no official statistics are available.

However, figures on the importation of annatto seeds/seed equivalents to different parts of the world may be found in various market reports (2)/(4).

USA and West Europe are the two largest importers of seeds, with the USA having a greater increase of imports in the period from 1983 to 1990. In the USA Chr. Hansen's is the largest importer of annatto seeds/seed equivalents.

Japan has doubled the import of annatto in the same period and is thus an important market.

Europe imports approx. 2500t seeds/seed equivalents per year. The distribution amongst countries is estimated in various reports.

England and the Netherlands are the two main importers of annatto, importing an amount of approx. 700t seeds/seed equivalents each in 1990.

However, the import figures do not tell about the pattern of consumption in Europe.

First of all most of the seeds imported into Holland are re-exported into other European countries owing to the fact that Rotterdam is a busy commercial port.

Slide 7 shows that UK and France are the two major consumers of annatto, in Europe.

UK has a consumption of annatto in seed equivalents being 40% of the total EEC market, France 30% and the rest is distributed amongst the other countries. Denmark and Ireland are the two third largest importers of annatto seeds/seed equivalents.

Both UK and France are large producers of cheese as already mentioned.

The imports and consumption of annatto seeds/seed equivalents seems to be quite steady on the European market.

The market growth will depend on many factors – the most important ones being legislation and the consumer trends.

The European market consists of many countries, each having their own food traditions – and what is very important – their own legislation.

If a comparison is made to countries like the USA, Japan and Brazil it is clearly seen that Europe in total is a large market.

The market, however, in each country is small compared to Japan, Brazil and the USA.

One cannot consider the market for annatto without considering the legislation in each of the European countries.

4. LEGISLATION

Legislation on food colours started in the sixties in most European countries.

The use of colours (synthetic as well as natural) and other food additives is regulated by the so-called positive lists.

A positive list specifies **which colours** and **what amount** is allowed in each food type. Each food additive has an EEC-number.

The positive lists of each member country in the EEC will be "joined" in a "common" list for all EEC countries. The list is almost ready and is expected to take effect in 1992. Ingredients not mentioned in the positive list are not allowed to be used in food products.

What will this list look like with special relevance to the colours?

The last proposal dates from April 1989 (5). In this proposal the colours allowed will be as follows:

One can see that annatto is certainly still on the list. No changes in ADI or maximum limit have occurred.

However – the synthetic colours will still be present for some purposes.

5. CONSUMER TRENDS/COMPANY POLICIES

Legislation is not always enough to predict a market. Consumers are the most important factor. What will the average European consumer demand from food products?

For each food product sold in the European countries a declaration of ingredients has to be present.

Additives (colours) are declared by an EEC-number or by its full name. The consumer has the erroneous opinion that EEC-numbers cover synthetic chemicals, almost certainly dangerous, and not at all necessary in food products.

This disapproval of EEC-numbers has resulted in an increasing interest from food manufacturers in flavours being able to add colour to food products. This is because flavours or aromatic extracts do not have EEC-numbers yet and they are not declared like other additives (8, 10, 11).

They are declared as:

Examples of such "coloured" flavours are:

Paprika
Turmeric
Hibiscus
Spinach
Sandalwood
etc.

Another way to avoid EEC-numbers is by adding β-carotene which is declared as provitamin A.

As long as the European legislation does not demand flavours to be declared by EEC-numbers these flavours might be preferred. In this connection the price is of less importance. It must be considered as a fact that consumers will pay a higher price for a product which claims to be "all natural", trusting that no colour has been added.

Annatto cannot be declared as a spice or a pro-vitamin!

How can annatto based natural colours meet this challenge in the years to come?

6. FUTURE ASPECTS

In order to keep the market for annatto – or, preferably, increase it – several challenges have to be met.

What could increase the use of annatto in the future?

– First of all the annatto colours have unique properties in cheese and milk products because of the nor-bixin reactivity to casein.

No other natural colour is able to colour cheese, cheese rind and sausage casings so effectively.

The ability to colour a surface can be expanded to include snack food (nuts, extrusion products etc), bakery confections (e.g. coloured almond flakes) and confectionery (e.g. sugar pastilles).

Annatto shows a superior stability over β-carotene and paprika in extruded snack products and breakfast cereals (12). This has been documented lately by The French Institute, ENSIA.

– Annatto can be used in orange flavoured soft-drinks. In order to penetrate the market for this type of products it is necessary to develope alternative formulations of acid stable annatto products (4).

Most important is, however, the latest interest in carotenoids as antioxidants and as anti carcinogenic agents. This has revealed a new interest in these colours for food. Actually carotenoid colours could protect food against oxidation and thus play an important biological role as anti carcinogenic agents. (14, 15, 16)

No research – or very little – has been done on annatto in this matter.

The carotenoid structure with conjugated double bonds, however, indicates that bixin should have similar effects as shown with β-carotene.

A scientific paper (ref.) reports that bixin should have the same "quenching" effect (capacity to trap mutagenous free radicals) as β-carotene. This is indeed very interesting, because β-carotene is promoted with the above-mentioned effects in Europe.

I am confident that if an intensified investigation and research should indicate these quenching effects for annatto it would definitely have a very positive effect on the future sales potential of annatto colours.

In order to meet the competition from β-carotene this work should be emphasized by the producers of annatto, e.g. through NATCOL.

7. CONCLUSION

The market for annatto in Europe will most probably remain at a stable level in the future.

High quality seeds are vere important in order to obtain concentrated and price competitive annatto colours. Alternative formulations of bixin/norbixin with increased stability (e.g. in acidic solution) should be investigated. In order to increase the market for annatto a positive biological role of bixin/norbixin as anti carcinogenic agents should be investigated.

It is my hope that all producers of annatto will join in this effort to compete with β-carotene.

Chr. Hansen's Laboratory has taken steps to support research work in carotenoids and specially annatto with emphasis on the anti oxidative effects in food.

What are the other demands?

– Annatto seeds should contain pigment levels above 2.5-3% in order to be able to produce high quality annatto colours. Seeds with lower pigment content give lower yield in colour production.

– Annatto extracts or concentrated bixin/norbixin powders should be standardized and tested for impurities, heavy metals, pesticides etc. to meet the increasing demands from the market.

Alternative extraction procedures (CO_2-extraction) should be evaluated in order to avoid organic solvents.

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