Focus on Chocolate

Chocolate consumption in pregnancy and neonatal behaviour

Chocolate is highly liked by all people, with a stronger liking by females. The female craws show a very well defined craving peak for chocolate in the menstrual period, beginning from a few days before the onset of menses and extending into the first few days of menses (17). Pope et al. reported that most adolescents (86%) cravings during pregnancy for sweets, especially chocolate (18). While many studies have investigated effects of maternal caffeine ingestion on neonatal behaviour (19-24), a small number of studies have detected the effects of maternal chocolate ingestion. Effects of prenatal chocolate consumption on temperament characteristics were evaluated on 305 months old healthy infants. The infants of mothers who reported consuming chocolate daily, were more reactive and active. These data suggested that "chocolate may have positive and salubrious effects" (25). We reported a case of hyperexcitability syndrome in a newborn infant of chocoholic mother (26). The infant manifested, immediately after birth, irritability and jitteriness. In the following days the symptoms persisted, and inconsolable crying, excessive sucking, and sleeping difficulties developed. Treatment with phenobarbital, for a week, did not modify symptomatology. Maternal history showed that the mother was a chocoholic mother (26). The infant developed. Treatment with phenobarbital, for a week, did not modify symptomatology.

REFERENCES

Chocolate pieces with probiotic yogurt cultures

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By now consumer’s ever-increasing awareness of health issues is beginning to concern nutrition sectors which were until recently unaffected by these considerations. Semi-luxury food like chocolate is thereby pushed into a dilemma between the consumer’s desire for enjoyable indulgence and his request for beneficial dietetic side effects. The contemporary consumer is aiming at a healthy diet without having to abstain from indulgence. With the market providing numerous enriched products such as fruit juices and breakfast cereals he is beginning to expect nutritional benefit also from presumably unhealthy products such as sweets. Product development in this sector is facing a variety of possibilities, e.g. the enrichment of chocolate with vitamins, minerals and fibres or the focus on healthy ingredients of cocoa itself. Recent developments have e.g. created sugarfree chocolates not only appealing to the
diabetic customer. Throughout the last 10 years dairy products containing living probiotic bacteria cultures have proven a success in international markets. Various scientific studies have shown a positive effect on the intestinal flora and the immune system (1). Contemporary technological possibilities of producing and preserving bacteria cultures for different applications, gave rise to the idea of developing and producing probiotic chocolate. E.g. the inclusion of active bacteria in fat-microparticles showed a positive effect on product stability (3) which led to the assumption that the high fat content in chocolate would also save the freeze dried product from early activation. This article aims to briefly illustrate the beneficial effects of these microorganisms as well as provide some information of the production process.

**DEFINITION**

Probiotics (lat.: “for life”) Probiotics consist of microorganisms which when consumed in sufficient quantity positively affect human health (4). Among these probiotic Lactobacilli have been applied for a long time but also yeasts and other species are commonly utilized. Probiotics can be consumed via specially prepared food or pharmaceuticals. Probiotics must be differentiated from prebiotics, certain fibres, which promote the multiplication of the probiotics, and synbiotics, a combination of the former two.

**STRAINS OF BACTERIA: CHARACTERISTICS AND APPEARANCE**

*Lactobacillus acidophilus*

*Lb acidophilus* belongs to the genus *Lactobacillus*. It converts lactose into D- and L-lactic acid. The bacterium’s resistance to gastric and bile acid enables it to reach deeper parts of the intestine. Regular consumption of such cultures results in their residing on the intestinal wall where they positively influence their microbial environment (5). Lactobacilli are found on plants, in the intestine, on the skin and the mucosa of humans and animals.

*Bifidobacterium bifidum*

*Bifidobacterium* belongs to the family of *Bifidobacteriaceae*. They only exist under anaerobic conditions and produce lactic acid as well as acetic acid from lactose. The bacteria are utilized in the production of yogurt. They are naturally found in the intestinal flora (6).

**HEALTH BENEFITS OF PROBIOTIC BACTERIA**

Proven effects (2)
- Certain bacteria strains have proven to improve the digestion of lactose in patients suffering from lactose malabsorption (2).
- Probiotics reduce the frequency and duration of diarrhoea diseases.
- Other research has pointed out their reduction of cancer promoting enzymes in the colon.
- Studies demonstrated a positive stimulation of the immune system (in vitro) and the (1).
- provision of certain water soluble vitamins.

**Discussed effects (2)**
- Further studies investigate a decreasing effect on the blood cholesterol level.
- Probiotics are supposed to strengthen the immune system and thereby preventing infections.
- Finally the reduction of the risk of carcinogenesis is still being researched in further detail.

**UTILIZATION OF PROBIOTICS IN CHOCOLATE**

The utilization of freeze dried probiotic cultures in chocolate requires a low degree of water activity of the chocolate mass (aw-value <0.4). This is to prevent the inactive microorganism to prematurely reach an active state and thereby reducing their efficiency in the long run. Their activity is not to unfold before reaching the water based medium of the intestine.

Furthermore temperature during the production process must not exceed 40°C as these temperatures would destroy the microorganisms in very short time. Exact dosage and even mixture of the probiotics within the chocolate mass in the last step of production before forming and cooling is therefore vital. During storage the probiotic product must be kept under controlled cooling conditions to minimize a reduction of the number of microorganisms.

**ACTIVITY LOSS DURING THE STORAGE OF THE PROBIOTIC CHOCOLATE**

The probiotic microorganisms must not unfold their activity before reaching human intestine after consumption. Therefore it is essential to protect the probiotic product from activity loss during storage. The following diagrams show some tests of the development of the bacterial count (cfu/g) in dark and milk chocolate containing 1g / kg probiotic powder during a storage period of 6 months at different storage conditions (8 and 22 °C).

**CONCLUSIONS**

At a dosage of 1 g bacteria (0.5 g probiotic strain of *Lactobacillus* + 0.5 g probiotic strain of *Bifidobacterium*) per kg chocolate mass the degradation rate at a storage temperature of 8°C after 6 months is very low.

Possible application areas for chocolate enriched with probiotic bacteria are e.g. breakfast cereals, ice cream and dairy products.

**REFERENCES:**

5. http://nutrition.a-w.de/de/ger/LEIXKON/LL001300.htm - Definition: Lactobacillus acidophilus