Increasing demands of the retail industry, escalating product liability and the claim of the consumer to transparency and naturalness in his food pose higher demands on the food’s shelf life in the meat industry. The balancing act between the longest possible shelf life and “clean label” makes it necessary to consider alternative ways of freshness. Well known are vinegar and lemon juice, they exist but in a technologically modern disguise.

By Dietmar Bohlen

Buzzwords like “traditional” or “natural” are well received by the consumer and the food retailing. Unfortunately, the traditional food preserving methods like smoke, salt or drying have reached their limits a long time ago. Today you conserve safely with modern shelf life extenders based on lactate and / or acetate. If there was not the vexing issue of “clean label” and the E-numbers.

WTI Inc. was founded in the 90s by Wolfgang Ludwig and his two sons. The still owner operated family business, develops, reviews and produces all products at the site in Jefferson in Atlanta / Georgia. Currently WTI Inc. employs internationally about 70 staff. Wolfgang Ludwig had a decisive influence in the US meat industry in the 1970s until well into the 1990 years, certainly one reason why he was just added to the “hall of fame” of the American meat industry.

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Therefore, it was only consequent, that the industry started thinking about a combination of modern, safe and on the other hand, natural - E-number-free - shelf life extenders. One result of the research in this direction is the buffered / spirit vinegar.

Vinegar with its low pH-value of 3.0 to 3.3 is ideal for preservation. A pH-value in this area has a negative effect on the water binding capacity though. From 2003, a method to obtain the fresh retentive properties of vinegar, but at a pH-value of approximately 5.9, was developed by the company WTI Inc. in the United States.

In this method, vinegar bacteria convert the through fermentation formed Ethanol, with a so-called “subterminal oxidation” via acetaldehyde (Ethanal) into acetic acid. The resulting vinegar is concentrated. In a further process, the vinegar is buffered with the help of a natural mineral, so that a pH-value of 5.9 is reached.

Unlike industrially produced sodium acetate (E262) based on acetic acid, no catalysts, or sodium hydroxide are used as a processing aid. Therefore, “buffered vinegar” is subject to no E-Number. In Germany, however, due to the vinegar regulation, it is not recommended to declare only vinegar in the list of ingredients. However, with an addition such as “buffered” or “modified” one is on the safe side.

The resulting “buffered vinegar” can be applied to liquid in the meat production, but is dried to a greater extent and ground to a powder. This powder is easy to transport and store. It can be processed dry, as a solution and even as a spray. In general, regarding the product, one speaks of DV, which stands for “dried vinegar”.

Effects of buffered vinegar

The natural acids penetrate through the cell membrane into the cytoplasm of the harmful bacteria. The pH-value in the cell is minimally changed so that the cell proliferation is reduced accordingly (bacteriostatic principle). By using buffered vinegar in a non-cured, sliced sausage, usually a longer shelf life of at least two to three days is achieved.

In the two illustrations lactate, acetate, DV and a control batch were compared during long-term storage tests. The overview lists only the results of the listeria growth. Tested were a cooked sausage and a ham.

DV can be easily processed in many meat products due to the powdered or liquid consistency. In addition, buffered vinegar is applied in ‘ready meals’, poultry and even fish. Usually, the powder is dosed with 1 to 4 grams per kilogram of the finished product. A safe fresh keeping can be achieved by this low dose, at low cost. The taste of the buffered / spirit vinegar is neutral. At some tastings at the end of the shelf life a fresh taste was reported, which was evaluated as positive.

For special applications, combination products of buffered vinegar and buffered lemon juice are also available. These products are free of E-numbers as well, DV, but also the liquid products are completely free of allergens and certified according to Halal and Kosher.

Even though the standards and requirements in the European meat industry are generally higher than in the rest of the world, it is still worth to see which methods and targets
can be found in other regions of the globe. In the US, the country of origin of the buffered vinegar, DV is used by default as shelf life extender, mainly when the final product is sold as “all natural”. Of course, this is done with the consent of the US agency for food inspection and drug registration (FDA).

Due to the distinct product liability in the USA and the zero-tolerance towards listeria, DV is there also used as so-called “secondary safety”. This regards the protection of the product after opening the package. Meat and meat products manufacturing companies in the United States are willing to go to great lengths to protect their reputation - the use of DV is one of them.

In this challenging environment, WTI Inc., as the inventor of the buffered / spirit vinegar, has established itself within the last ten years as a leader and pioneer.

Dietmar Bohlen is CEO of WTI International GmbH operating from Germany. WTI International is the worldwide operating export company for WTI Inc. in Jefferson (Georgia, USA). At the location in Hofheim, near Frankfurt airport, WTI International organizes the technological support, sales and distribution for customers in Europe, Asia, Oceania and South America.

WTI International GmbH
Teutonenstr. 20a
65719 Hofheim – Germany
Tel. +49 (0)6192 9285 690
E-Mail: contact@wti-international.com
www.wti-international.com