

Consequences of TTI-Applications for controlling the freshness in the run of the EU-food-hygienic-regulation

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Temperature-time-integrators (TTI), which reacts on temperature, are developed since a few years. They don't give any information about the food-specific going-off-situation because on the temperature-influence. The approach of TTI-applications, which are programmable for different, specific going-off-dynamics (microbiology) for the different food, puts us now in the situation that we are able to have a detailed temperature-experience-control. Prerequisite for this is the hermetically blocking of the food to the environment, this is staying for: different food has to be wrapped appropriately.

Such a TTI-approach presupposes a nearly perfect food-hygienically status in the pre-processes till the packing and supposes a minimally contamination at the time of packaging. This status can be seen as the 'starting-contamination of the wrapped food'. If the starting-contamination is low and the food is temperature-controlled stored, the contamination-growing-dynamic is also low. If the controlled temperature is missing, it might be a big, nearly explosively growing of contamination. So controlled temperatures and atmosphere are prerequisites for the use of the 'going-off-dynamic' for the TTI. Both effects, temperature and atmosphere, also the 'small-clime' in the wrapping, must be controlled over the complete logistical move from the packaging-process to the hands of the consumer.

The atmospherically questions must be differenced between vacuumed and protective-gas packaging, which atmosphere orientates at the possible being of anaerobe and aerobe micro organisms. The selling-optic (red flesh) is a position, that must not be ignored as a criteria for the atmosphere in the packaging.

This aspects:

1. temperature
2. humidity
3. microbiological start-contamination at packaging
4. atmosphere in packaging
5. packaging-material and being contamination-free
6. requirements for the optical appearance

are the basically prerequisites and guidelines for the truth of the 'going-off-dynamically' statements of the TTI to the condition of the food.

Process-conditions, that control the humidity and the 'start-contamination' (aspects 2-6), can be granted with clean process-praxis's (HACCP etc.). So the temperature has an decisive function for the 'going-off-dynamic'.

If the temperature is accompanied by a 'going-off-dynamically' TTI from the packaging-situation until the hands of the consumer (selling in food-shops), it will show the temperature-experience-status of the food with the TTI-colour. The colour-changing shows now the 'going-off-status'. Prerequisite is that the 'starting-contamination' is known. The security of this information is the prerequisite for the truth of the TTIs colour-statement and its ratio for the status of the food.

If the 'good-praxis' is supposed over the complete food-production, the temperature-colour-information of the 'going-off-dynamic' TTI is correct. The colour of the indicator is lawful a piece of

circumstantial evidence for the consumption- or the microbiological-contamination –status of the food.

In view of the European-food-hygienic-regulation, the European-basic-regulation 178/2002 fixes that the status of the food and its experiences must be identifiable. The TTI-shown 'going-off'-status draws its own conclusions from un-controlled temperature-segments in the processes from the packing till the selling in a shop. The food with TTI-colour-'going-off'-display allows an out-slucing of 'gone-off' food trough the whole process-flux or a 'special offer' if the food is not gone off already. This raises the food-security till the cash desk in the food-shop.

The European-basic-regulation 178/2002 as part of the European-food-hygienic-regulation refers to some behaviour-rules. The important ones are:

1. §10 ,...to adopt measures aimed ... and at ensuring that systems exist to identify and respond to food safety problems ...'
2. § 12 ,In order to ensure the safety of food, it is necessary to consider all aspects of the food production chain as a continuum from and including primary production and the production of animal feed up to and including sale or supply of food to the consumer because each element may have a potential impact on food safety.'
3. The use of 'going-off'-dynamically TTIs would correspond to the requirements of the guideline 92/59 EWG of June, the 29th 1992 that rules the requirements of 'fast-warn-systems'.
4. With that the using of 'going-off-dynamic' TTIs corresponds to the destination of use, ruled in article 1 and following of the European-basic-regulation 178/2002.
5. The TTI, attached on every wrapped food, would ensure a safe status destination, even for the problematically 'charges-supply'. Even because there might not be the same contamination in one charge.
6. This projection corresponds to chapter II, section 4, paragraph 18 specially segment 2 and paragraph 19 segment 1 and 2 of the European-basic-regulation 178/2002 and further reach trough the shops about paragraph 19.

The food-shop gives the consumer the responsibility for the food. The shop gets an base of law, because the TTI-status is scanned at the cash desk. A later exchange and a 'gone-off' food in the hands of the consumer is nearly debarred.

The consumer himself is able to control if he gave the food some to high temperatures. This moves to a higher security for the food in the hands of the consumer.

The whole European-food-hygienic-regulation postulates constant HACCP-concepts and 'good-Praxis' on creating and producing food. This extrapolates minimally 'start-contaminations'.

The date of perishability is nothing else as a promise that the food will not go off till this date if the food is treated prescribed. Mistakes and contamination-growing is not excludable, because the whole production is process- and not product-optimised.

The situation in the fresh- and food-logistic shows, that the destination-change is slowly understood:

The processes must not push the products, but the products and their particularities push the processes.

This paradigm is current for all products, that take part in logistically processes, but particularly for fresh-products and 'fast going off' products.

Through these paradigm-changes the conversion of the European-food-hygienic-regulation becomes reachable by correlated configuring the processes.

'Going-off-dynamically' TTIs favour the law-security trough the whole process-chain, from the packaging, over the shop until the consumer. The consumer gets the control to see the quality of the product in view on temperature and he sees if his temperature-orientated-use of the food is making slower the 'going-off'-process.

A physical 'going-off'-gas-indicator would complement control the 'start-contamination' and reacts, if the temperature starts a microbiological growing. This would be another step for food-security in sense of the European-food-hygienic-regulation.

Concluding stays the question: Are 'going-off'-dynamically TTIs able to control the mycotically contamination-growing or the growing of yeasts over the temperature?