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Book of Abstracts

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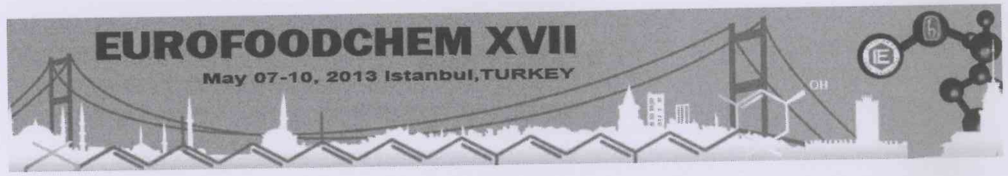

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Risk Assessment, Risk/Benefit Analyses

Effects of Food Processing on Food Constituents

ASSESSMENT OF CONSUMERS EXPOSURE TO PESTICIDES IN APPLES AND THE POTENTIAL HEALTH RISK

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Pesticides are chemical substances, which are commonly used in apples orchards to protect these fruit from different over 40 pests and diseases. The use of pesticides in apples orchards (in Poland sometimes increasing up to 30 kg/ha pesticides) is directly related to an increase in farm productivity. Apples are important component of the human diet (consumption of apple: 59.1g/person/day for adults and 34.5 g/person/day for children) as these are sources of vitamins and minerals. But, fresh apples could also be a potential source of harmful and toxic pesticides residues. Thus, food safety, particularly apples, has become a major public concern worldwide.

The objective of this study was to analyze residue levels of pesticides in apples from Poland producers during two years (2010-2012) and health risks analysis. The concentrations of over 160 pesticides were determined by gas chromatograph coupled with selective detectors (GC–EC/NP) and spectroscopic technique in locally produced of 636 apples purchased from individual farms.

The results indicated that 66% all samples of apples were contained pesticides, only 7% contained pesticide residues above MRLs and 59% contained pesticide residues at or below maximum residue limits (MRLs).

Twenty two compounds were detected 747 times in apple samples (fungicides and insecticides). Respectively, twelve fungicides occurred in the samples within a range of frequency of 0.6% to 83%, and ten insecticides occurred within the range of frequency of 0.6% to 17%. Among fungicides the most detected were: captan (34.4%, range of residues 0.02-0.25 mg/kg), dithiocarbamates (26.9%, 0.05-0.62 mg/kg), pirimicarb (11.3%, 0.01-0.12 mg/kg) and pirymethanil (9%, 0.01-0.48 mg/kg). Not authorized pesticides in apple orchards were noted: tolyfluanid and phosalone (1%). The MRL was exceeded for: cyprodinil, diazinon, dimethoate, fenitrothion, flusilazole and pirymethanil in range concentration: 0.01-0.62 mg/kg.

Among apple samples with residues, 31% contained one residue (acetamipryd, dithiocarbamates, captan, pirymethanil, pirimicarb and tolyfluanid), as well as multiple residues were observed. Two, three, four and six residues were present in 24.5%, 9%, 1.4% and 0.5% of samples, respectively.

Multiresidue in apples samples, in terms of quality and food safety, may carry increased risks to health of consumers, due to the overlapping various effects of the compounds characterized by a different mode of action. Based on the results of the occurrence of pesticide residues in apples long- and short-term health riskwas estimated.The estimated daily intakes (EDIs) ranged from 0.16% of the ADI (acceptable daily intake) for triflixystrobin to 76.1% of the ADI for diazinon for children.

The our results provided important information on the current pesticide contamination status of the most consumed fruits in Poland and show that these pesticides detected in apples are not be considered a serious public health problem. Estimatedlong-term and short-term exposures associated with the consumption of apples were small and the risk of adverse health effects was negligible. These fruits can be eaten by small children and adult consumers in both the short and the long time.

Keywords: pesticide residues, apples, dietary exposure

RISK ASSESSMENT OF CAMPYLOBACTER IN BROILER CHICKEN MEAT IN ALGERIA

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Summary

Campylobacter is being one of the leading causes of foodborne illness in many countries, with broilers' meat as an important vehicle. Risk assessment of this bacteria in broilers in order to identify the current gaps in the poultry process of slaughterhouses that need to be managed to provide high quality products to the consumer.

This Risk Profile concern Campylobacter in poultry (whole and pieces), which deserves retailed poultry meat to Batna population

In one hand , two hundred sixty fecal samples (droppings , cloacal swabs) issued from 13 broiler flocks containing approximatively 40000 broiler chicken by flock were studied and 172 Campylobacter species were isolated.

In summer, these broiler chicken were directed to slaughterhouse to perform samples from 30 whole poultry carcasses (neck skin, viscera and liquid rinsing) at 3 critical points of the poultry process (Defaithring Evisceration, and rinsing) Campylobacter was seaked in these samples according to ISO 1072 method. We recovred from the 3 critical points 100%, 70% and 50% of Campylobacter and were identified as Campylobacter jejuni, *Campylobacter coli* and Campylobacter lari

The study of the antimicrobial profile of differents strains showed that antimicrobial resistance was associated to 2, 3, 4, 5, and 6 antibiotics, which leads to 11 différents résistance patterns.

The most commonprofile was found 8 times and included the following antibiotics: ampicillin, Amoxicillin-Clavulanic Ac., erythromycin andtetracycline (AM, AMC, E, TE)

In another hand, sixty samples of human stools belonging to young children suffering from diarrhea and caused by chicken meat consumption were analyzed to seek Campylobacter species. Only 3 strains were recovred from their samples and identified as Campylobacter jejuni, Campylobacter coli and Campylobacter upsalensis

In conclusion we noticed that Campylobacter is a pathogen which remain almost present in broiler chicken meat after transformation and causes in developing countries illness, among infants and children which have low level of acquired immunity .

Key words: Campylobacter, Broiler chicken, Slaughterhouse, Risk exposure; infant

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FUROSINE AND N(epsilon)-CARBOXYMETHYLLYSINE IN COOKED LAMB MEAT

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Aim of these investigations was to assess the content of Maillard reaction products (MRP) in meat samples and reveal possible effects due to differences in preparation and added ingredients (glucose and ribose). A new meat cooking technique (low temperature under vacuum to get a more tender meat) was investigated. In order to generate the characteristic taste and colour of roasted meat, monosaccharides like glucose or ribose are added before vacuum cooking to enhance non-enzymatic browning, known as the Maillard reaction. In the course of the Maillard reaction, various sugar and amino acid derivatives are formed. To evaluate the development of the reaction cascade, reaction products from different stages are useful. The Amadori rearrangement product (ARP), resulting from the reaction of glucose with the ε-amino group of lysine, characterizes the early stage of the Maillard reaction. Nε-carboxymethyllysine (CML) represents the final stage and belongs to the group of advanced glycation endproducts (AGE).
Existing analytical methods were transferred to the matrix meat for both analytes. ARPs of lysine were transferred to furosine via hydrolysis with 6 N hydrochloric acid and analyzed with amino acid analyzer [1]. CML was analyzed by high performance liquid chromatography with tandem mass spectrometry after hydrolysis with 6 N hydrochloric acid and solid phase extraction. [2]
A good correlation between sugar addition and cooking conditions was found only for furosine. In meat samples with added sugar, 87±32 mg furosine/100 g protein in vacuum cooked samples and 122±42 mg furosine/100 g protein in oven cooked samples were analyzed. In meat samples without sugar addition, comparable contents around 30 mg furosine/100 g protein could be measured. CML content was between 4 and 5 mg/100 g protein and was not affected by addition of sugar or increased cooking temperatures. This result is in good accordance to the literature [3].
In conclusion, very small amounts of ARP and CML are formed during cooking of native lamb meat. An addition of sugars resulted in slightly increased contents of furosine in all samples and increased levels in samples with higher cooking temperature. For CML, no increase even after addition of glucose and ribose could be found. Cooked meat, therefore, is only a minor dietary source of Maillard reaction products.
Keywords: meat, furosine, Nε-carboxymethyllysine, CML, flavor
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EFFECTS OF FOOD PROCESSING ON PESTICIDE RESIDUES IN BLACKCURRANTS

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Fresh fruits are the important part of a healthy diet because of the presence of significant amount of nutrients and minerals in them. The black currants (*Ribes nigrum*) and their products are extremely rich inantioxidants and vitamins especially vitamin C. However, at the same time, they can also turn out to be source of toxic substances such as pesticides. Pesticides are chemical substances, which are commonly used in modern agriculture practices to protect the crops from different pests and diseases. Like other crops, black currants are attacked by pests and diseases during production to damages that reduce the quality and the yield. The use of pesticides have increased because they have rapid action, decrease toxins produced by ford infecting organisms and are less labour intensive than other pest control methods.
Especially dangerous are those products which pesticide residue concentration exceeds the permissible limits called maximum residue level (MRL). Ensuring the quality of food in all food chain from "farm to fork", is a priority of the food security. Modern lifestyle has contributed to increasing consumption of processed food, recently. Blackcurrant berries are eaten either fresh, but more and more often after household and industrial processing treatments in the form of various kinds of juices, jams, jellies, pomades, mousses, etc.
Therefore, the aim of this research was to evaluate the strategy to remove harmful pesticides from blackcurrants and to ensure the safety of these products for consumers. The effect of the most common food technological processes such as washing and cooking on pesticide residue concentration levels was assessed.
Test material was obtained by controlled field experiments (according to Good Experimental Practice). Chemical treatments based on application of ten plant protection products were carried out on separated blackcurrant plot during cultivation. In the collected plant material pesticide residue levels were determined (ranged from 0.10 to 3 mg/kg). Pesticides were extracted using accredited multi residue method (MRM) based on matrix solid phase dispersion (MSPD) followed by gas chromatography and two single residue methods (SRM) using liquid chromatography (thiophanate-methyl residues) and spectrophotometry (thiram residues).
The effects of washing and cooking on the levels of acaricides (fenazaquin, proparite), insecticides (alpha-cypermethrin, deltamethrin and lambda-cyhalothrin) and fungicides (boscalid, bupirimate, difenoconazole, pyraclostrobin, thiophanate-methyl and thiram) were quantified. In the most cases the processing factors (PFs) (the concentration of pesticide after processing divided by the concentration before processing) of tested pesticides indicated a reduction of the residue in the processed commodity (PFs <1). Some exceptions, where PFs were higher than 1 (concentration factor) were also noted.
Keywords: food processing, pesticide residues, processing factor