

stability of flaxseed oil, resulting in low peroxide value of flaxseed oil, comparing to the traditional glass packaging. The PV of flaxseed oil stored in glass bottle was 0.49 mmol O₂/kg oil, as same as at the end of analysis, while PV of flaxseed oil stored in PuOC/zein film pouches was 0.49 mmol O₂/kg oil at the beginning, and decrease during the storage time to 0.40 mmol O₂/kg oil.

Conclusions: Based on the results, we found that PuOC/MZ films was acting as oxygen barrier and antioxidant agent delaying the development of rancidity in flaxseed oil and showed potential to be used as pouches for food packaging.

Keywords: (maximum 5): Pumpkin oil cake; Zein; Flaxseed oil.

149/1064. Oxidative stability of pork fat enriched with omega3 and natural antioxidants by modifying animal's diet

Author(s): (1) Daniela Miotto Bernardi; (2) Teresinha Marisa Bertol; (2) Anildo Cunha Junior; (2) Arlei Coldebella; (3) Daniel Barrera Arellano; (4) Valdemiro Carlos Sgarbieri.

Affiliation: (1) Nutritionist. Department of Food and Nutrition. School of Food Engineering. State University of Campinas. UNICAMP. Brazil; (2) Researcher. Embrapa Pork and Poultry. Concórdia. Brazil.; (3) Researcher. Department of Food Technology. School of Food Engineering. State University of Campinas. Campinas. Brazil; (4) Researcher. Department of Food and Nutrition. School of Food Engineering. State University of Campinas. Campinas. Brazil.

Introduction: The omega-3 (ω -3) increment in food products has gained great importance, however, despite the benefits, the incorporation of this fatty acid, increases lipid oxidation susceptibility.

Objectives: To produce pork fat with high oxidative stability, higher ω -3 concentrations and better ω -6/ ω -3 ratio compared to conventional pork fat.

Method / Design: 96 pigs (48 males and 48 females) aged 127.39±4.29 days distributed in randomized blocks were used. Six treatments were evaluated for 42 days: (C) control diet without the addition of oil, (L) diet with 3% of linseed oil, (LGP) diet with 3% of linseed oil + 10% grape pomace, (LGSE) diet with 3% linseed oil + 0.0022% grape seed extract, (LH) diet with 3% of linseed oil + 5% tilapia protein hydrolysate and (LVitE) diet with 3% linseed oil + 0.04% vitamin E. The lipid profile of lard was evaluated by gas chromatography and fat oxidative stability by Rancimat.

Results: Considering the ether extract percentage, the C18:3 percentage was C=1.16±0.061, L=5.28±0.338, LGP=5.58±0.227, LGSE=5.37±0.164, LH=5.05±0.206, LVitE=5.07±0.302 (p<0.001), the percentage of C20:5 was C=0.0, L=0.052±0.005, LGP=0.045±0.004, LGSE=0.047±0.004, LH=0.038±0.004, LVitE=0.047±0.003 (p<0.001). C22:6 was not detected. The ω -6/ ω -3 ratio was C=13.49±0.62, L=3.37±0.123, LGP=3.11±0.084, LGSE=3.05±0.069, LH=3.24±0.084, LVitE=3.34±0.139 (p<0.001). The oxidative stability analysis demonstrated a retention time of C=7.83±0.07, L=3.15±0.01, LGP=2.98±0.24, LGSE=3.19±0.021, LH=3.53±0.155, LVitE=6.69±0.02 hours. The L, LGP, LGSE, LH and LVitE treatments had significant incorporation

of ω -3, but only LVitE presented increase in oxidative stability, with stability similar to group C without ω -3.

Conclusions: The use of 3% of linseed oil in the diet, for 42 days was effective in increasing the ω -3 content and improving ω -6/ ω -3 ratio of pork fat. However, from the tested antioxidants, only vitamin E increased the oxidative stability of fat.

Keywords: (maximum 5): omega-3, vitamin E, natural antioxidants, oxidative stability, pork fat

149/1068. OR2M3 – a specialist receptor for a key food odorant of the genus Allium

Author(s): (1) Franziska Noe; (2) Dietmar Krautwurst.

Affiliation: (1) Ph.D. student food chemistry. Deutsche Forschungsanstalt fuer Lebensmittelchemie. Freising. Germany; (2) Leader department physiology. Deutsche Forschungsanstalt fuer Lebensmittelchemie. Freising. Germany.

Introduction: The recognition of key food odorants (KFO) appears to be the most eminent capability of odorant receptors (ORs). Among KFOs, thiols engage an outstanding position, because of their extremely low odour thresholds. 3-mercapto-2-methylpentan-1-ol is a KFO of the genus Allium with an odour threshold in the pg/L range.

Objectives: Polymorphisms in OR genes, e.g. single nucleotide polymorphisms (SNPs), copy number variations (CNVs), or insertions/deletions (INDELS) lead to individual haplotypes. Such differences could explain an individually altered odour perception, such as specific anosmia or hyperosmia, which may explain different consumer food preferences. However, the molecular mechanisms underlying an extremely specific and sensitive detection of foodborne thiols are unknown, so far.

Method / Design: Therefore, we first screened a library of 391 human ORs against the KFO 3-mercapto-2-methylpentan-1-ol, and subsequently the single 'hit' receptor OR2M3 against a library of KFOs. Moreover, a human study (100 subjects) revealed different phenotypes for the perception of 3-mercapto-2-methylpentan-1-ol, so far.

Results: Here we show that only one single receptor out of 391 ORs responded to μ mol/L concentrations of 3 mercapto-2-methylpentan-1-ol in a concentration-dependent manner. Despite the common belief of combinatorial odorant coding, i.e. one receptor can be activated by several odorants, in contrast, here we found highly specific responses of OR2M3 to more than 100 KFOs and thiols tested, so far. Neither were other receptor homologs activated by the KFO 3-mercapto-2-methylpentan-1-ol, nor was OR2M3 activated by other KFOs. However, different OR2M3 haplotypes, defined by coding SNPs, displayed differences in EC50 values for 3-mercapto-2-methylpentan-1-ol.

Conclusions: So far, our data suggest OR2M3 as a specialist for a single dominant KFO in the overall aroma of onions, which are used all over the world as food, and play a role in complementary medicine since about 5000 years. Recently, two other family-2 OR have been assigned thiols as agonists, suggesting thiols as best agonists for family-2 OR.