

食品科学

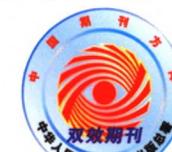
FOOD SCIENCE

2020年第41卷第7期

半月刊

2020年4月15日出版

2020 7



中国出版政府奖期刊提名奖

ISSN1002-6630
CN11-2206/TS



Damin
大闽国际



Q K 2 0 3 0 1 7 8 广告

天然植物原料研究与生产供应服务商。

国家高新技术企业、博士后科研工作站、省级
重点实验室。

- 通过ISO9001、ISO14001、ISO22000、
FSSC22000、HACCP、BRC认证
- 通过美国及欧盟有机茶加工认证
- 通过Kosher及Halal认证
- 通过CNAS国际实验室认可



ISSN 1002-6630



07>

产品系列：
速溶茶及浓缩液、草本提取物及浓缩液、
咖啡系列、罗汉果甜甙、植物提取物、天
然果蔬粉系列、五谷杂粮粉系列、茶叶系
列、固体饮料、BIB系列、ODM/OEM代
工服务

大闽食品（漳州）有限公司
地址：福建省漳州市蓝田开发区
电话：+86-0596-2100018
传真：+86-0596-2100019
网址：www.daminfood.com



官方微信公众号



目次

食 品

2020年 第41卷

基础研究

- 乳酸对阴沟肠杆菌生物膜形成的抑制作用 刘亚文, 靳盼盼, 许晓曦*, 刘芳*, 孙芝兰(1)
长黑青稞中不同形态多酚的提取及
体外抗氧化活性 朱昱琳, 杨士花, 黄勇桦, 李永强*, 张建平, 李晴, 陈壁, 初雅洁, 李淳, 黄艾祥(8)
植物糖原-槲皮素复合物的制备及特征 韦倩倩, 樊金玲*, 朱文学, 白喜婷, 任国艳(14)
制备条件对结冷胶流体凝胶形成的影响 陈青, 李荣, 周涛涛, 程红梅, 韩晓祥(23)
大豆蛋白与千叶豆腐品质特性关系 王喜波, 聂鑫, 廖一, 罗佳倩, 吕秀莉,
刘季善, 刘军, 王中江, 滕飞, 李良, 李杨*(30)
新疆花生品种(系)蛋白亚基组成及品质特性分析 袁秋岩, 刘红芝, 张健, 李利民, 吴斌, 王强*(38)
牛至精油对腐生葡萄球菌抑制作用机制 陈梦玲, 蓝蔚青*, 李函笑, 任智楚, 芦子萱, 谢晶*(46)
孔石莼多糖锌结构表征与体外降血糖活性 汤陈鹏, 吕峰*, 王蓉琳(52)
肠膜明串珠菌素mesenterocin ZLG85分子结构及对伤寒沙门氏菌的抗菌机理 高玉荣, 李大鹏, 张凤琴, 宋俊梅(59)
表面糊化处理确定乙酰化羟丙基
小麦淀粉中取代基团分布 赵凯, 刘宁, 李君, 雷鸣, 陈威, 杨春华, 陈凤莲(66)
紫花苜蓿茎叶功能特性指标的测定与分析 来思彤, 崔清亮*, 刘金龙, 刘俊丽, 孙灯(73)

食品工程

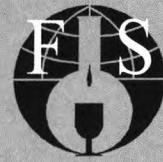
- 超声复合碱处理对Oleosin蛋白结构及功能特性的影响 孙禹凡, 齐宝坤, 钟明, 刘墨, 杨树昌, 李杨*(79)
热风干燥过程中带壳鲜花生水分迁移特性及品质变化 卢映洁, 任广跃*, 段续, 张乐道, 凌铮铮(86)
Multi-Scale Structure and Physicochemical Properties of Highland

- Barley Starch Following Dry Heat Treatment BIAN Huawei, ZHENG Bo, CHEN Ling, ZHU Huilian* (93)
苹果汁冷冻浓缩与真空蒸发浓缩效果的对比 秦贯丰, 丁中祥, 原姣姣, 蒋润花, 黄斯珉, 邵友元(102)
射流空化对大豆分离蛋白的理化性质及结构的影响 白银, 高悦, 王中江, 江中洋, 孟凡迪, 江连洲*(110)
射频处理对红枣中短波红外干燥动力学及

- 品质特性的影响 王坤华, 李佳美, 彭飞, 刘昱迪, 马琦, 李梅*, 徐怀德*(117)
不同杀菌方式对即食豆干大豆异黄酮及品质特性的影响 叶韬, 陈志娜, 叶倩文, 刘慧乾, 王云, 陆剑锋*(124)

营养卫生

- Protective Effect and Underlying Mechanism of Aplysin on
Ethanol-Induced Liver Injury in Rats CHANG Zhishang, LIU Ying, SU Ai, WANG Wencheng,
XU Hongwei, JIANG Yushan, LIANG Hui* (131)
糖基化酪蛋白消化物对正常小鼠免疫调节作用的影响 时佳, 赵新淮*(140)
桑叶生物碱对四氯化碳联合高脂饮食诱导的小鼠肝纤维化的改善作用 王祖文, 杨忠敏, 黄先智, 丁晓雯*(146)
硫辛酸和白藜芦醇在对乙酰氨基酚致HepG2细胞损伤中的抗氧化作用 赵丽云, 刘爱莲, 刘美玉*, 任晓锋(153)



第07期 总第620期

小麦低聚肽对急性酒精中毒小鼠

抗氧化功能的影响 于兰兰, 刘伟, 周雅琳, 李雍, 秦勇, 李睿珺, 许雅君*(159)
姬松茸多肽提取物对D-半乳糖致衰老

模型小鼠的保护作用 冯晴霞, 闫宇宁, 杨峰, 周嘉宁, 李乐斌, 卢学春*, 安丽萍*(164)

包装贮运

基于气相色谱-质谱、液相色谱-质谱技术研究贮藏

过程中滩羊肉脂肪代谢通路转换 苑昱东, 李子欣, 罗瑞明*, 剧柠, 尤丽琴(171)
近冰温贮藏对杏果实冷害及活性氧代谢的影响 李亚玲, 崔宽波, 石玲, 祝兆帅, 李玲, 刘严, 朱璇*(177)
冷激结合甜菜碱处理对西葫芦冷害及能量代谢的影响 张苗, 姜玉, 汤静, 金鹏, 郑永华*(184)
反式-2-己烯醛对梨果黑斑病菌*Alternaria alternata*的

抑菌作用及其机理 董玉鹏, 孙萍, 李永才*, 毕阳, 张苗, 黄怡, 张婷婷(191)
鸡蛋贮藏过程中脂质氧化与内源酶活性的相关性 刘钰, 赵孟斌, 于浩坤, 杨莉, 吕兵, 王庆玲*(198)
冰水混合物结合溶菌酶对菠菜品质及硝酸盐含量的影响 李翠红, 魏丽娟, 慕钰文, 冯毓琴*(203)
不同减菌化处理方式对暗纹东方鲀冷藏

期间品质变化的影响 冯豪杰, 蓝蔚青*, 刘大勇, 丛建华, 臧一宇, 唐书文, 周大鹏, 谢晶*(210)

专题论述

纳米金的合成及其在重金属离子检测中的应用进展 刘丰源, 辛嘉英*, 孙立瑞, 王艳, 夏春谷(218)
3-甲基丁醛对奶酪坚果风味的贡献及其生物合成的研究进展 陈臣, 周文雅, 袁佳杰, 于海燕, 田怀香*(228)
柑橘果皮角质层及其对采后贮藏保鲜影响的研究进展 杨绿竹, 王馨雨, 王蓉蓉, 单杨, 张群, 丁胜华*(234)
鸡蛋消费与胆固醇稳态相关性研究进展 徐亦驰, 彭诗怡, 杨芳*(245)
葱属植物活性物质及其生理功能研究进展 于晶, 温荣欣, 闫庆鑫, 陈倩, 秦立刚*(255)
姜黄素膜运载体系的构建及功能性应用研究进展 周阿容, 林以琳, 邱建清, 曾绍校*, 林少玲*(266)
植物多糖的抗肿瘤活性研究进展 边亮, 陈华国, 周欣*(275)
葡萄酒酿造过程中谷胱甘肽的研究进展 苏静, 龚荣(283)
果胶结构域精细结构研究进展 易建勇, 毕金峰*, 刘璇, 吕健, 周沫, 吴昕烨, 赵圆圆, 杜茜茜(292)
脆弱性评价及其在食品欺诈中的应用研究进展 宋华欣, 张星联, 陆柏益*(300)
乳酸菌缓解酒精性肝病的研究进展 李慧臻, 史佳鹭, 占萌, 关嘉琦, 闫芬芬, 霍贵成*(306)
食源二肽基肽酶IV抑制剂的研究进展 赵蕊, 姚鑫森, 周野, 管立军, 张英蕾, 李哲滨, 沈卉芳, 崔怡娟, 卢淑雯*(315)

食醋大曲功能微生物菌群与全氟化合物污染现状及其与肝型脂肪酸

结合蛋白相互作用研究进展 方国康, 徐建明, 李若慧, 蒋丹, 黄迎春*(329)



Contents

FOOD

2020 Vol.41 No.07

Basic Research

- Inhibitory Effect of Lactic Acid on Biofilm Formation of *Enterobacter cloacae* LIU Yawen, JIN Panpan, XU Xiaoxi*, LIU Fang*, SUN Zhilan (1)
Extraction and Antioxidant Activity of Different Polyphenols from 'Changhei' Hullless Barley ZHU Yulin, YANG Shihua, HUANG Yonghua,
LI Yongqiang*, ZHANG Jianping, LI Qing, CHEN Bi, CHU Yajie, LI Chun, HUANG Aixiang (8)
Preparation and Characterization of Phyloglycogen-Quercetin Complex WEI Qianqian, FAN Jinling*, ZHU Wenzhe, BAI Xiting, REN Guoyan (14)
Effects of Preparation Conditions on the Formation of
Gellan Gum Fluid Gels CHEN Qing, LI Rong, ZHOU Taotao, CHENG Hongmei, HAN Xiaoxiang (23)
Relationship between Soybean Protein and Qianye Tofu Quality WANG Xibo, NIE Xin, LIAO Yi, LUO Jiaqian, LÜ Xiuli, LIU Jishan,
LIU Jun, WANG Zhongjiang, TENG Fei, LI Liang, LI Yang* (30)
Analysis of Protein Subunit Composition and Quality Characteristics of
Peanut Varieties (Lines) Grown in Xinjiang YUAN Qiuyan, LIU Hongzhi, ZHANG Jian, LI Limin, WU Bin, WANG Qiang* (38)
Action Mechanism of Oregano Essential Oil against
Staphylococcus saprophyticus CHEN Mengling, LAN Weiqing*, LI Hanxiao, REN Zhichu, LU Zixuan, XIE Jing* (46)
Structural Characterization and Hypoglycemic Activity *in Vitro* of
Ulva pertusa Polysaccharides-Zinc Complex TANG Chenpeng, LÜ Feng*, WANG Ronglin (52)
Molecular Structure and Antimicrobial Mechanism of Mesenterocin ZLG85, a Bacteriocin Produced by
Leuconostoc mesenteroides subsp. *mesenteroides* against *Salmonella typhi* GAO Yurong, LI Dapeng, ZHANG Fengqin, SONG Junmei (59)
Distribution of Substitution Groups in Acetylated and Hydroxypropylated
Wheat Starch after Chemical Surface Gelatinization ZHAO Kai, LIU Ning, LI Jun, LEI Ming, CHEN Wei, YANG Chunhua, CHEN Fenglian (66)
Determination and Analysis of Functional Characteristics of
Alfalfa Stems and Leaves LAI Sitong, CUI Qingliang*, LIU Jinlong, LIU Junli, SUN Deng (73)

Food Engineering

- Functional Characteristics of Oleosin Affected by
Ultrasound-Assisted Alkali Treatment SUN Yufan, QI Baokun, ZHONG Mingming, LIU Zhao, YANG Shuchang, LI Yang* (79)
Moisture Migration Properties and Quality Changes of Fresh
In-Shell Peanuts during Hot Air Drying LU Yingjie, REN Guangyue*, DUAN Xu, ZHANG Ledao, LING Zhengzheng (86)
Multi-Scale Structure and Physicochemical Properties of Highland
Barley Starch Following Dry Heat Treatment BIAN Huawei, ZHENG Bo, CHEN Ling, ZHU Huilian* (93)
Comparative Experimental Study on Freeze Concentration and Vacuum
Evaporation Concentration of Apple Juice Frank G. F. QIN, DING Zhongxiang, YUAN Jiaojiao, JIANG Runhua, HUANG Simin, SHAO Youyuan (102)
Effect of Jet Cavitation on Physicochemical Properties and
Structure of Soy Protein Isolate BAI Yin, GAO Yue, WANG Zhongjiang, JIANG Zhongyang, MENG Fandi, JIANG Lianzhou* (110)
Effects of Radio Frequency Treatment on Short- and Medium-Wavelength Infrared
Drying Kinetics and Quality Characteristics of Red Jujubes WANG Kunhua, LI Jiamei, PENG Fei, LIU Yudi, MA Qi, LI Mei*, XU Huaide* (117)
Effect of Different Sterilization Methods on Isoflavone Profile and Quality
Characteristics of Ready-to-Eat Dried Soybean Curd (Tofu) YE Tao, CHEN Zhina, YE Qianwen, LIU Huiqian, WANG Yun, LU Jianfeng* (124)

Nutrition and Hygiene

- Protective Effect and Underlying Mechanism of Aplysin on
Ethanol-Induced Liver Injury in Rats CHANG Zhishang, LIU Ying, SU Ai, WANG Wencheng, XU Hongwei, JIANG Yushan, LIANG Hui* (131)
Immunoregulatory Effect of Glycated Casein Digest in Normal Mice SHI Jia, ZHAO Xinhua* (140)
Improvement Effect of Mulberry Leaf Alkaloids on Hepatic Fibrosis Induced by Carbon
Tetrachloride Combined with High-Fat Diet in Mice WANG Zuwen, YANG Zhongmin, HUANG Xianzhi, DING Xiaowen* (146)
Comparative Protective Effect of Lipoic Acid and Resveratrol on Acetaminophen-Induced
Cellular Oxidative Damage in HepG2 Cells ZHAO Liyun, LIU Ailian, LIU Meiyu*, REN Xiaofeng (153)

SCIENCE

Contents



Serial No.620

Effects of Wheat Oligopeptides on Antioxidant Function of

Mice with Acute Alcoholism YU Lanlan, LIU Wei, ZHOU Yalin, LI Yong, QIN Yong, LI Ruijun, XU Yajun* (159)

Protective Effect of *Agaricus blazei* Protein Peptides on

D-Galactose-Induced Aging Model in Mice FENG Qingxia, YAN Yuning, YANG Yi, ZHOU Jianing, LI Lebin, LU Xuechun*, AN Liping* (164)

Packaging, Storage and Transportation

Conversion of Lipid Metabolism Pathways during Storage of Tan Sheep Fat

Evaluated by GC-MS and LC-MS YUAN Yudong, LI Zixin, LUO Ruiming*, JU Ning, YOU Liqin (171)

Effect of Near Freezing Temperature Storage on Chilling Injury and

Active Oxygen Metabolism of Apricot Fruit LI Yaling, CUI Kuanbo, SHI Ling, ZHU Zhaoshuai, LI Ling, LIU Yan, ZHU Xuan* (177)

Effects of Cold Shock Combined with Glycine Betaine Treatment on

Chilling Injury and Energy Metabolism of Zucchini ZHANG Miao, JIANG Yu, TANG Jing, JIN Peng, ZHENG Yonghua* (184)

Inhibitory Effect and Mechanism of *trans*-2-Hexenal against Inoculated

Alternaria alternata on Pear Fruit DONG Yupeng, SUN Ping, LI Yongcai*, BI Yang, ZHANG Miao, HUANG Yi, ZHANG Tingting (191)

Correlation between Lipid Oxidation and the Activity of

Endogenous Enzymes during Egg Storage LIU Yu, ZHAO Mengbin, YU Haokun, YANG Li, LÜ Bing, WANG Qingling* (198)

Effect of Combined Treatment with Ice Water and Lysozyme on

Spinach Quality and Nitrate Content LI Cuihong, WEI Lijuan, MU Yuwen, FENG Yuqin* (203)

Effects of Different Sterilization Treatments on the Quality of Puffer Fish (*Takifugu obscurus*)

during Refrigerated Storage FENG Haojie, LAN Weiqing*, LIU Dayong, CONG Jianhua, ZANG Yiyu, TANG Shuwen, ZHOU Dapeng, XIE Jing* (210)

Reviews

Recent Progress in Synthesis of Gold Nanoparticles and Its Application in

Detection of Heavy Metal Ions LIU Fengyuan, XIN Jiaying*, SUN Lirui, WANG Yan, XIA Chungu (218)

Recent Progress in Biosynthesis of 3-Methylbutanal and

Its Contribution to Nutty Flavor in Cheese CHEN Chen, ZHOU Wenya, YUAN Jiajie, YU Haiyan, TIAN Huaiyang* (228)

Progress in the Knowledge of the Cuticle of Citrus Fruits and Its Effect on

Postharvest Fruit Quality during Storage YANG Lüzhu, WANG Xinyu, WANG Rongrong, SHAN Yang, ZHANG Qun, DING Shenghua* (234)

Recent Progress in Understanding the Correlation between

Egg Consumption and Cholesterol Homeostasis XU Yichi, PENG Shiyi, YANG Fang* (245)

Bioactive Constituents of *Allium* and Their Physiological Functions: A Review YU Jing, WEN Rongxin, YAN Qingxin, CHEN Qian, QIN Ligang* (255)

Recent Progress in the Construction and Functional Application of

Curcumin Membrane Delivery Systems ZHOU Arong, LIN Yilin, QIU Jianqing, ZENG Shaoxiao*, LIN Shaoling* (266)

Recent Advances in Understanding the Antitumor Activity of

Polysaccharides from Plants BIAN Liang, CHEN Huaguo, ZHOU Xin* (275)

Recent Advances in Understanding Glutathione during Wine-Making Process SU Jing, GONG Rong (283)

A Review: Domain Fine Structure of

Pectic Polysaccharides YI Jianyong, BI Jinfeng*, LIU Xuan, LÜ Jian, ZHOU Mo, WU Xinye, ZHAO Yuanyuan, DU Qianqian (292)

Vulnerability Assessment and Its Applications in Food Fraud: A Review SONG Huaxin, ZHANG Xinglian, LU Baiyi* (300)

Recent Advances in Applying Lactic Acid Bacteria for

Alleviating Alcoholic Liver Disease LI Huizhen, SHI Jialu, ZHAN Meng, GUAN Jiaqi, YAN Fenfen, HUO Guicheng* (306)

Recent Advances and Future Prospects of Food-Derived Dipeptidyl Peptidase IV Inhibitors ZHAO Rui, YAO Xinmiao, ZHOU Ye,

GUAN Lijun, ZHANG Yinglei, LI Zhebin, SHEN Huifang, CUI Yijuan, LU Shuwen* (315)

Recent Progress in Functional Microbial Community and Quality

Evaluation of Vinegar *Daqu* HUANG Jing, YAN Weiwei, LIU Shuliang*, LIU Aiping, AO Xiaolin, WANG Rui, YANG Yong, DU Dazhao, CHEN Fusheng (322)

Current Pollution Situation of Perfluorinated Compounds in Waters and Foodstuffs and Recent Progress in Understanding

Their Interactions with Liver Fatty Acid Binding Protein FANG Guokang, XU Jianming, LI Ruohui, JIANG Dan, HUANG Yingchun* (329)



自然醇厚 鲜味升级

更丰富鲜味 减盐 降糖

即食汤料鲜味升级解决方案



安琪官微

酱油、调味酱、休闲食品减盐解决方案



安琪官网

饮料降糖解决方案

安琪酵母股份有限公司 电话: 0717-6369988 传真: 0717-6369752 邮箱: ye@angelyeast.com

国内刊号: CN11-2206/TS 邮发代号: 2-439 定价: 40元