



全国中文核心期刊 中国科技核心期刊
中国农林核心期刊 RCCSE中国核心学术期刊 (A)



中国畜牧兽医

CHINA ANIMAL HUSBANDRY &
VETERINARY MEDICINE

第50卷
Vol. 50

第6期
No.6

2023年6月



主管： 中华人民共和国农业农村部
主办： 中国农业科学院北京畜牧兽医研究所

中国畜牧兽医

ZHONGGUO XUMU SHOUYI

第 50 卷 第 6 期 2023 年 6 月

目 次

· 生 物 技 术 ·

绵羊 miR-449a/b 前体序列组织表达及生物信息学分析
..... 王赛桥,赵 路,翟振翰,张丙雷,贾万航,王玉琴(2175)

不同氧浓度下猪睾丸间质细胞转录组分析..... 陈楷文,赵云娇,王 磊,张剑搏,马玉红,吴国芳(2185)

藏猪 CDKN1B 基因克隆、生物信息学及表达分析
..... 韦明邦,边巴琼达,肖青青,段梦琪,强巴央宗,商 鹏(2196)

高温胁迫下罗非鱼源无乳链球菌的比较转录组分析.....
..... 施金谷,黄珊珊,黄基伟,陈坤海,胡大胜,朱志雄,韩书煜(2207)

· 生 理 生 化 ·

连二亚硫酸钠诱导大鼠肝细胞氧化应激模型的建立.....
..... 孙 晨,戈 胜,宁夏青,王佳琦,张暖暖,王晓然,张士霞(2217)

LPS 通过 ROS/p38/MAPK 信号通路对鹅胚肝细胞凋亡的影响
..... 钟粤韵,杨舒展,陈非玥,陆智儿,李冰心,李婉雁,田允波,黄运茂,许丹宁,曹 楠(2224)

西红花苷在动物抗氧化作用中的研究进展 王 静,宋红兵,吴艳玲,林威敏,肖天放(2233)

低氧对牦牛肺动脉平滑肌细胞增殖及氧化应激损伤作用的影响.....
..... 李 睿,张伊阳,罗雪慧,周熯琳,吴绍米,杨 琨,乔自林(2245)

AMPK 对过氧化氢诱导细胞衰老的阻遏研究 陈 翠,龚 蕾,徐 哲,汪小波(2255)

· 营 养 与 饲 料 ·

血清白蛋白的功能、应用及纯化工艺研究进展 吴 旋,曾申明(2265)

锌、乳酸杆菌对感染沙门氏菌乳鸽免疫及抗氧化功能的影响
..... 汪阳阳,秦士贞,唐德富,邵玉新,史兆国,王 铮,李 星,赵东栋(2276)

短链脂肪酸调控骨骼肌生理功能研究进展 杨瑰桃,马继登,李学伟,葛良鹏,张进威(2286)

孜然秸秆替代小麦秸秆对羔羊生长和屠宰性能及血浆生化指标的影响.....
..... 李杨辉,许 涛,张淑贤,刘 珂,贾天晴,陈 宁,尹君亮,席琳乔,王 栋,周小玲(2296)

暗斑对蛋鸡蛋品质的影响及其与肠道功能的关系	杜元军,段国超,刘 玮,李大鹏, 韩海霞,雷秋霞,周 艳,刘 杰,王 杰,曹顶国,李福伟,陈 甫(2305)
果胶/壳聚糖姜黄素微胶囊制备及其体外人工胃肠道耐受性研究	徐紫嫣,姜 洋,刘学涛,刘柏含,张 文,严昌国,崔莲花(2312)
产气荚膜梭菌噬菌体及乳酸杆菌联用改善肉鸡生长性能和调节肠道菌群功能研究	吴立婷,陆 睿,刘半红,包红朵,王永娟,周 艳,王 冉,张 辉(2321)
发酵菜籽粕的营养价值与抗营养因子及其在动物生产中的应用	高世华,王 芳,尹业鑫,谭碧娥,印遇龙,陈家顺(2333)
槲皮素饲料添加剂延长鸡蛋贮存时间的研究	杨庆林,吴 昊,刘家言,伏雨欣,周帅帅,卢 涵,丁满溢,李 垚(2342)
· 遗 传 繁 育 ·	
抑制 BMP/Smad 信号通路对水牛卵巢颗粒细胞生长和类固醇激素合成的影响	徐媛媛,郑海英,杨春艳,邓廷贤,黄晨茜,冯 超,陆杏蓉,段安琴,莫 霞,马小娅,尚江华(2354)
丙酮酸钠对山羊冷冻精子质量的影响	吕春荣,梁家充,邵庆勇,吴国权,张玉梅,权国波(2363)
松辽黑猪 <i>HBEGF</i> 基因多态性及其与繁殖性状的关联分析	张方玮,张 琪,雷亮亮,孙武胜,张 迪,张云鹏,张净搏,王修权,张 晶,张树敏(2370)
α -亚麻酸对水牛卵巢颗粒细胞体外培养的影响	肖 鹏,尚江华,杨春艳,李孟琪, 段安琴,马小娅,冯 超,黄晨茜,张 博,周金陈,韦科龙,郑 威,郑海英(2380)
谷胱甘肽对绵羊精液低温保存效果的影响	刘锦钰,张 杨,马旭梅,周 千,周 扬,张春香,石 磊,任有蛇(2388)
· 预 防 兽 医 ·	
鸭坦布苏病毒 Capsid 蛋白原核表达及多克隆抗体制备	焦琳琳,成玉婷,吴庆国,吴 双,吴 植,朱善元,钱莺娟(2395)
3 种猪冠状病毒 <i>N</i> 基因密码子偏好性及宿主适应机制研究	孙守湖,陈志飞,郭智轩,俞 婷,王修武,李松倍,魏文康,贺东生(2403)
猪 RegⅢ γ 蛋白的重组表达及功能研究	李 灿,李楚楚,曾 维,张 宁,纪春晓,陈 韬(2414)
lncRNA 在畜禽肌肉发育中的研究进展	李 洁,陈楚雯,赵瑞鹏,刘 媛,李志雄(2427)
规模化猪场常见呼吸道细菌性病原的流行病学调查	曹 琪,金 清,袁 意,冯逸雪,孔丹妮,陈翔鸿,吴 斌,宋文博,汤细彪(2439)

柔嫩艾美耳球虫 *MIF* 基因克隆及生物信息学分析
..... 李永彬,杨惠琳,宋子豪,张 昱,杨 瑾,孟 佳,崔小珍,吕晓玲,郑明学,白 瑞(2450)
新型疫苗佐剂研究进展..... 韩 冰,汤思淇,朱大帷,李海玲,
冯亚莉,苏超凡,徐艺娜,冷昊钰,王永涛,张月美,太晓春,张 莹(2460)
2020—2021 年中国部分地区猪流行性腹泻病毒 S1 基因遗传变异分析
..... 史秋颖,段宝敏,李 颖,牛登云,耿晨阳,周佳伟,王 蕊,冯敬敬(2468)
溶血性曼氏杆菌截短型白细胞毒素的原核表达及多克隆抗体制备.....
..... 宋 越,苏胜杰,张 帆,白 帆,戴伶俐,王 娜,王大伟,杨茜雯,赵世华,张月梅(2479)
猪细小病毒 6 型 *ORF2* 基因的截短表达及多克隆抗体制备
..... 欧云文,潘 琴,汪 洋,代军飞,任绍科,张 洋,张 杰(2487)
丝状噬菌体对宿主菌适应性影响的研究进展.....
..... 李晓宇,李若愚,王 晓,王丽丽,李纪彬,李淑英,徐永平(2496)

· 基 础 兽 医 ·
基于网络药理学与分子对接探究中兽药复方乳康颗粒治疗奶牛乳房炎的作用机制.....
..... 樊艺萌,魏媛媛,王惠茹,尕 玉,张艳楠,赵卿宇,郝智慧(2507)
黄芩多糖的提取及结构表征 刘 鹏,李静静,乔彦良,朱连勤,朱风华(2518)
基于溃疡性结肠炎模型探讨锦灯笼提取物的抗炎及抗氧化作用.....
..... 牛叶雨,沈 琪,白 勇,孙盼盼,孙 娜,尹 伟,范阔海,李宏全,孙耀贵(2531)
贝莱斯芽孢杆菌发酵对乳康方剂中药有效成分提取效果的影响.....
..... 薛沾枚,刘雪松,张 艳,张 备,孟维珊,张国华,王 岩,钟 鹏,邱景会,汤继龙,史同瑞(2540)
基于网络药理学探究菟丝子黄酮缓解孕期暴露双酚 A 致仔鼠生殖损伤的作用机制
..... 赵千惠,刘 莹,焦玉兰,史万玉,陈福星(2550)
鹅源副鸡禽杆菌的分离鉴定及致病性研究.....
..... 卢玉葵,刘佳琪,钟嘉诚,陈济钊,朱婉君,张溢珊,张济培(2562)
炭疽芽孢杆菌携带前噬菌体的预测及耐药性与毒力分析.....
..... 陈建师,张 宁,浦方雄,苗健佳,曾 楠,李炳学(2573)
基于网络药理学和分子对接分析野黄芩苷抗卵泡闭锁的作用机制.....
..... 张新越,孙 娜,孙盼盼,张 华,范阔海,尹 伟,孙耀贵,李宏全(2585)

CHINA ANIMAL HUSBANDRY & VETERINARY MEDICINE

Vol. 50 No. 6 (June 2023)

SELECTED CONTENTS

• Biotechnology •

Tissue expression and bioinformatics analysis of miR-449a/b precursor sequences in sheep
..... WANG Saiqiao,ZHAO Lu,ZHAI Zhenhan,ZHANG Binglei,JIA Wanhang,WANG Yuqin(2175)

Transcriptome analysis of porcine Leydig cells under different oxygen concentrations
..... CHEN Kaiwen,ZHAO Yunjiao,WANG Lei,ZHANG Jianbo,MA Yuhong,WU Guofang(2185)

Cloning,bioinformatics and expression analysis of CDKN1B gene in Tibetan pigs
..... WEI Mingbang,BIANBA Qiongda,XIAO Qingqing,DUAN Mengqi,CHAMBA Yangzom,SHANG Peng(2196)

Comparative transcriptome analysis of *Streptococcus agalactiae* from tilapia under high temperature stress
..... SHI Jingu,HUANG Shanshan,HUANG Jiwei,CHEN Kunhai,HU Dasheng,ZHU Zhixiong,HAN Shuyu(2207)

• Physiological and Biochemical •

Oxidative stress model of BRL-3A cells induced by sodium hydrosulfite
..... SUN Chen,GE Sheng,NING Xiaqing,WANG Jiaqi,ZHANG Nuannuan,WANG Xiaoran,ZHANG Shixia(2217)

Effects of LPS on apoptosis of goose embryo-derived hepatocytes ROS/p38/MAPK signaling pathway
..... ZHONG Yueyun,YANG Shuzhan,CHEN Feiyue,LU Zhier,LI Bingxin,
LI Wanyan,TIAN Yunbo,HUANG Yunmao,XU Danning,CAO Nan(2224)

Research progress of crocin in animal antioxidants
..... WANG Jing,SONG Hongbing,WU Yanling,LIN Weimin,XIAO Tianfang(2233)

Effect of hypoxia on proliferation and oxidative stress injury of pulmonary artery smooth muscle cells in yaks
..... LI Rui,ZHANG Yiyang,LUO Xuehui,ZHOU Manlin,WU Shaomi,YANG Kun,QIAO Zilin(2245)

Study on the inhibition of hydrogen peroxide-induced cellular aging by AMPK
..... CHEN Cui,GONG Lei,XU Zhe,WANG Xiaobo(2255)

• Nutrition and Feed •

Research progress on the function,application and purification technology in serum albumin
..... WU Xuan,ZENG Shenming(2265)

Effects of zinc, *Lactobacillus* on immune and antioxidant function of squabs infected with *Salmonella*
..... WANG Yangyang,QIN Shizhen,TANG Defu,
SHAO Yuxin,SHI Zhaoguo,WANG Zheng,LI Xing,ZHAO Dongdong(2276)

Research advance on regulation of skeletal muscle physiology function by short chain fatty acids
..... YANG Guitao,MA Jideng,LI Xuewei,GE Liangpeng,ZHANG Jinwei(2286)

Effect of replacing wheat straw with cumin straw on growth performance,slaughter performance and plasma biochemical parameters of lambs
..... LI Yanghui,XU Tao,ZHANG Shuxian,LIU Ke,JIA Tianqing,
CHEN Ning,YIN Junliang,XI Linqiao,WANG Dong,ZHOU Xiaoling(2296)

Effect of translucent on egg quality and its relationship with intestinal function of laying hen
..... DU Yuanjun,DUAN Guochao,LIU Wei,LI Dapeng,
HAN haixia,LEI Qiuxia,ZHOU Yan,LIU Jie,WANG Jie,CAO Dingguo,LI Fuwei,CHEN Fu(2305)

Preparation of pectin/chitosan curcumin microcapsules and its study on simulated gastrointestinal environments
..... XU Ziyang,JIANG Yang,LIU Xuetao,LIU Bohan,ZHANG Wen,YAN Changguo,CUI Lianhua(2312)

Combination of *Clostridium perfringens* phage and *Lactobacillus* improves growth performance and regulates intestinal
flora function of broilers WU Liting,LU Rui,LIU Banhong,BAO Hongduo,
WANG Yongjuan,ZHOU Yan,WANG Ran,ZHANG Hui(2321)

Nutritional value and anti-nutrient factor of fermented rapeseed meal and its application in animal production
..... GAO Shihua,WANG Fang,YIN Yexing,TAN Bi'e,YIN Yulong,CHEN Jiashun(2333)

Study of quercetin feed additives on prolonging storage time of eggs
..... YANG Qinglin,WU Hao,LIU Jiayan,FU Yuxin,ZHOU Shuaishuai,LU Han,DING Manyi,LI Yao(2342)

• Genetics and Breeding •

Effects of inhibition of BMP/Smad signaling pathway on the growth and steroid hormone synthesis of buffalo ovarian
granulosa cells XU Yuanyuan,ZHENG Haiying,YANG Chunyan,DENG Tingxian,
HUANG Chengqian,FENG Chao,LU Xingrong,DUAN Anqin,MO Xia,MA Xiaoya,SHANG Jianghua(2354)

Effects of sodium pyruvate on the quality of frozen goat sperm
..... LYU Chunrong ,LIANG Jiachong,SHAO Qingyong,WU Guoquan,ZHANG Yumei,QUAN Guobo(2363)

Polymorphism of *HBEGF* gene and its association with reproductive traits in Songliao Black pigs
..... ZHANG Fangwei,ZHANG Qi,LEI Liangliang,SUN Wusheng,ZHANG Di,
ZHANG Yunpeng,ZHANG Jingbo,WANG Xiuquan,ZHANG Jing,ZHANG Shumin(2370)

Effects of alpha-linolenic acid on buffalo ovarian granulosa cells cultured *in vitro*
..... XIAO Peng,SHANG Jianghua,YANG Chunyan,LI Mengqi,DUAN Anqin,MA Xiaoya,FENG Chao,
HUANG Chenqian,ZHANG Bo,ZHOU Jinchun,WEI Kelong,ZHENG Wei,ZHENG Haiying(2380)

Effects of glutathione on cryopreservation of sheep semen LIU Jinyu,ZHANG Yang,MA Xumei,
ZHOU Qian,ZHOU Yang,ZHANG Chunxiang,SHI Lei,REN Youshe(2388)

• Preventive Veterinary Medicine •

Prokaryotic expression and polyclonal antibody preparation of Duck Tembusu virus Capsid protein
..... JIAO Linlin,CHENG Yuting,WU Qingguo,WU Shuang,WU Zhi,ZHU Shanyuan,QIAN Yingjuan(2395)

Study on codon usage bias of *N* gene of three porcine coronaviruses and their host adaptive mechanism
..... SUN Shouhu,CHEN Zhifei,GUO Zhixuan,YU Ting,
WANG Xiuwu,LI Songbei,WEI Wenkang,HE Dongsheng(2403)

Recombinant expression and function study of RegⅢγ protein in porcine
..... LI Can,LI Chuchu,ZENG Wei,ZHANG Ning,JI Chunxiao,CHEN Tao(2414)

Research progress on long non-coding RNA of muscle development in livestock and poultry
..... LI Jie,CHEN Chuwen,ZHAO Ruipeng,LIU Yuan,LI Zhixiong(2427)

Epidemiological investigation of common respiratory bacterial pathogens in large-scale pig farms
 CAO Qi, JIN Qing, YUAN Yi, FENG Yixue, KONG Danni, CHEN Xianghong, WU Bin, SONG Wenbo, TANG Xibiao(2439)

Cloning and bioinformatics analysis of *MIF* gene in *Eimeria tenella* LI Yongbin, YANG Huilin, SONG Zihao,
 ZHANG Yu, YANG Jin, MENG Jia, CUI Xiaozhen, LYU Xiaoling, ZHENG Mingxue, BAI Rui(2450)

Research progress of novel vaccine adjuvants HAN Bing, TANG Siqi, ZHU Dawei, LI Hailing, FENG Yali,
 SU Chaofan, XU Yina, LENG Haoyu, WANG Yongtao, ZHANG Yuemei, TAI Xiaochun, ZHANG Ying(2460)

Analysis of genetic variation of S1 gene of Porcine epidemic diarrhea virus in some areas of China from 2020 to 2021
 SHI Qiuying, DUAN Baomin, LI Ying, NIU Dengyun, GENG Chenyang,
 ZHOU Jiawei, WANG Rui, FENG Jingjing(2468)

Prokaryotic expression and polyclonal antibody preparation of *Mannheimia haemolytica* truncated leukotoxin
 SONG Yue, SU Shengjie, ZHANG Fan, BAI Fan, DAI Lingli, WANG Na, WANG Dawei,
 YANG Qianwen, ZHAO Shihua, ZHANG Yuemei(2479)

Truncated expression of ORF2 gene of Porcine parvovirus type 6 and preparation of its polyclonal antibody
 OU Yunwen, PAN Qin, WANG Yang, DAI Junfei, REN Shaoke, ZHANG Yang, ZHANG Jie(2487)

Research progress on the influence of filamentous phages on host bacterial adaptability
 LI Xiaoyu, LI Ruoyu, WANG Xiao, WANG Lili, LI Jibin, LI Shuying, XU Yongping(2496)

• Basic Veterinary Medicine •

Potential mechanisms of Chinese veterinary medicine compound Rukang granules in the treatment of dairy cow mastitis
 based on network pharmacology and molecular docking technology
 FAN Yimeng, WEI Yuanyuan, WANG Huiru, GA yu, ZHANG Yannan, ZHAO Qingyu, HAO Zhihui(2507)

Extraction and structure characterization of *Scutellaria baicalensis* polysaccharide
 LIU Peng, LI Jingjing, QIAO Yanliang, ZHU Lianqin, ZHU Fenghua(2518)

Anti-inflammatory and antioxidative effects of extracts of *Physalis Calyx seu Fructus* based on ulcerative colitis model
 NIU Yeyu, SHEN Qi, BAI Yong, SUN Panpan, SUN Na, YIN Wei, FAN Kuohai, LI Hongquan, SUN Yaogui(2531)

Effect of *Bacillus velezensis* fermentation on extraction of active components from traditional Chinese medicine of Rukang
 prescription XUE Zhanmei, LIU Xuesong, ZHANG Yan, ZHANG Bei, MENG Weishan,
 ZHANG Guohua, WANG Yan, ZHONG Peng, QIU Jinghui, TANG Jilong, SHI Tongrui(2540)

Exploring of the mechanism of *Cuscuta chinensis* flavonoids in alleviating reproductive damage in offspring rats exposed
 to bisphenol A during pregnancy based on network pharmacology
 ZHAO Qianhui, LIU Ying, JIAO Yulan, SHI Wanyu, CHEN Fuxing(2550)

Isolation, identification and pathogenicity analysis of *Avibacterium paragallinarum* from geese
 LU Yukui, LIU Jiaqi, ZHONG Jiacheng, CHEN Jidang, ZHU Wanjun, ZHANG Yishan, ZHANG Jipei(2562)

Prediction of *Bacillus anthracis* carrying prophages and analysis of drug resistance and virulence
 CHEN Jianshi, ZHANG Ning, PU Fangxiong, MIAO Jianjia, ZENG Nan, LI Bingxue(2573)

Mechanism of scutellarin against follicular atresia based on network pharmacology and molecular docking
 ZHANG Xinyue, SUN Na, SUN Panpan, ZHANG Hua, FAN Kuohai, YIN Wei, SUN Yaogui, LI Hongquan(2585)

《中国畜牧兽医》编委会

主任委员：秦玉昌

委 员：（按英文字母/汉字笔画排序）

Julang Li, Canada

印遇龙 院士	任继周 院士	麦康森 院士	沈建忠 院士	张改平 院士		
陈化兰 院士	侯水生 院士	姚 斌 院士	夏咸柱 院士	譙仕彦 院士		
马月辉	王凤来	王文杰	王立贤	王加启	王楚端	文 杰
田见晖	朱 奎	朱化彬	朱鸿飞	刘国世	刘建新	李 奎
李发弟	李俊雅	李胜利	杨汉春	吕于明	张文广	张军民
张宏福	张家骅	陈继兰	范红结	罗会颖	罗海玲	单安山
赵茹茜	咎林森	秦贵信	贾玉山	郭 勇	郭 鑫	曹兵海
韩雪松	储明星	童光志	熊本海			

主 编：李 琨

副 主 编：卢庆萍 臧长江

编辑部主任：戴 晔

本期值班编辑：荣光辉

中 国 畜 牧 兽 医

（月刊，1974年创刊）

2023年6月5日 第50卷 第6期

China Animal Husbandry & Veterinary Medicine

(Monthly, Started in 1974)

Vol.50 No.6 June 5, 2023

主 管 中华人民共和国农业农村部
主 办 中国农业科学院北京畜牧兽医研究所
编辑出版 《中国畜牧兽医》编辑部
地 址 北京市海淀区圆明园西路2号
邮 编 100193
电 话 010-62816020 62811226 62810371
网 址 <http://www.chvm.net>
电子邮件 zgxsy@caas.cn
印刷装订 北京科信印刷有限公司
国内发行 北京报刊发行局
订 购 处 全国各地邮电局
国外发行 中国国际图书贸易集团有限公司
（北京399信箱）
国内定价 50元/期 600元/年

Superintended by Ministry of Agriculture and Rural Affairs, P. R. China
Sponsored by Institute of Animal Sciences, Chinese Academy of Agricultural Sciences (CAAS)
Published by Editorial Department of China Animal Husbandry & Veterinary Medicine
Address No.2 West Road Yuanmingyuan, Haidian, Beijing, China
Postcode 100193
Telephone 010-62816020 62811226 62810371
Website <http://www.chvm.net>
E-mail zgxsy@caas.cn
Issued by Beijing Kexin Printing Co.,Ltd
Subscription Domestic Post Office
Issued Abroad by International Book Trading Corporation
P.O.Box 399, Beijing, P.R.China

ISSN 1671-7236 邮发代号：2-215 国外代号：BM3517
CN 11-4843/S 广告发布登记证号：京海工商广登字20170085号

ISSN 1671-7236

