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## Purification and Characteristic of a Kind of Aminopeptidase from *Bacillus subtilis*

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**ABSTRACT** The purification procedure consisted of ethanol precipitation and two chromatographic steps, which included gel filtration and hydrophobic interaction chromatography. The aminopeptidase appeared to be a dimeric enzyme with a molecular mass of 75 ku determined by SDS-PAGE. The activity was optimal at pH 8.5 and 60℃. The temperature stability was 20~70℃ and the pH stability was 8.0~10.0. The enzyme was inhibited by several divalent cations ( $Zn^{2+}$ ,  $Ni^{2+}$ ). But  $Co^{2+}$  was activated by  $Co^{2+}$ . The enzyme seemed to be Zn- metalloenzyme and had two  $Zn^{2+}$  combined on the activation region. Km of the aminopeptidase was 1  $\mu\text{mol/L}$  and  $V_{\max}$  was 5 000  $\mu\text{mol}/(\text{L}\cdot\text{min})$ .

**Key words** *Bacillus subtilis*, aminopeptidase, purification, properties

行业动态

### 葡萄酒业 2006 年有望保持良好发展势头

国家信息中心经济预测部最新完成的饮料制造业分析报告指出,当前饮料制造业行业发展形势良好,从产销形势看,国人饮食习惯有所变化,2006年葡萄酒业有望保持良好发展势头。

2005年饮料制造业经济效益良好,全年规模及规模以上工业企业累计实现工业总产值3 073.51亿元,增速24.55%;产品销售收入3 036.44亿元,增速24.47%,增幅同比分别上升了6%和5%。饮料业和软饮料分别实现利润总额217.33亿元和79.07亿元,均增长30%以上;白酒业利润增长受阻,实现利润73.19亿元,增长25.69%,增幅同比回落了13.1%,同时白酒企业亏损额大幅上升,为6.15亿元,同比增长66.36%;啤酒业实现利润35.63亿元,同比增长24.99%,但增速不及2004年同期水平。葡萄酒业虽是创利小户,利润总额为12.56亿元,但增速第1,全年累计同比增长58.68%,增幅也比上年同期提高了46.65%。

从饮料业的生产格局来看,软饮料、啤酒和白酒生产所占比重最大,三者占整个行业产值的85%左右。全年白酒、葡萄酒和软饮料的产销状况较好,同期增长都在20%以上。2005年,全国共生产白酒349.4万t,同比增长15.04%,增幅同比下降了13%;啤酒产量3061.5万t,同比增长10.35%,增幅同比上升4.88%;葡萄酒产量累计43.4万t,同比增长25.42%,增幅下降10.65%。整个饮料行业销售状况良好,全年完成工业销售值3 008亿元,同比增长24.29%,增幅同比提高了5.03%。产品销售率也明显好于2004年。葡萄酒业工业销售值增长再度领先,增速达37.49%,增幅超过21.81%。

葡萄酒出口增长势头也令人瞩目。整个饮料业累计完成出口交货值106.58亿元,同比增长26.55%,增幅同比提高了16.84%。其中,葡萄酒出口产值为1.06亿元,同比增长37.5%,但增速同比则提高了83.61%。

整个饮料业前10家企业共完成产品销售收入562.9亿元,集中度为18.54%,实现利润总额70.17亿元,占行业比重32.3%。在所属子行业中,葡萄酒制造的产品销售收入和利润集中度最高,销售收入集中度为70.8%,利润集中度高达86.5%。白酒与啤酒销售收入集中度较低,利润集中度相对较高。

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## Study on Stability of Bovine Colostrums Insulin-like Growth Factors

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**ABSTRACT** The paper studied the activity of bovine colostrums insulin-like growth factors to reduce glucose concentration at different temperature and pH and by adding protective reagent. We tested the metabolic effect of bovine colostrums IGFs on balb/c3T3 fibroblast. The results showed 60% glucose left in the conditioned media in the presence of IGFs compared with control, meaning that IGFs could reduce glucose activity with comparative ability to that of insulin. The activity to reduce glucose concentration reached its peak when temperature was 4℃ and pH was 2~8 with 30% mannitol.

**Key words** bovine colostrums, insulin-like growth factors(IGFs), lower glucose active, stability

行业  
动态

### 灵芝滋补汤生产技术获国家发明专利

国家食用菌研究开发中心研制成功的灵芝滋补汤生产技术近日获得国家发明专利。国家食用菌研究开发中心隶属于中国食品发酵工业研究院,是国家级食用菌研究开发中心,是专门从事益生食用菌科学研究、产品开发、技术成果推广及应用的专业性研究机构。

灵芝是我国的珍稀食用菌品种,是深受人们推崇的滋补用品。灵芝多糖是灵芝中的生物活性物质,它能促进蛋白质、核酸的合成,对血清、肝脏及骨髓细胞蛋白质或核酸的更新、合成有促进作用,它是灵芝扶正固本的主要有效成分之一。国家食用菌研究开发中心采用生物发酵技术和超微粉碎工艺开发了灵芝滋补汤产品,使得灵芝营养成分得到高效保留;该项目采用专利技术,实现了灵芝功能因子的高效溶出和完全利用,灵芝滋补汤产品中富含灵芝多糖,是具有良好滋补功能的即食型产品。项目技术具有良好的应用前景。

信  
息  
窗

### 豆豆集团推出干法豆制品

豆制品是我国的传统食品,因富含优质大豆蛋白和多种人体不能合成的营养成分而备受群众喜爱。目前,我国豆制品生产一般仍沿用传统生产方式,水分含量高、保质期短、卫生质量难以控制。而且生产过程大量排放废水,能源消耗高,所生产的豆渣等副产品只能用作饲料或废弃,如不及时处理,很容易造成环境污染。河北高碑店豆豆食品(集团)有限公司开发研制的干法豆制品生产新技术,有效地解决了上述问题,为传统豆制品生产开辟了新的加工途径。该工艺是以优质大豆为原料,经脱脂、研磨、配合后,直接加热挤出成型,再经干燥,制成形状各异的豆制品。食用时用温水浸泡,可凉拌、热炒、佐餐配菜。据公司负责人介绍,该产品生产过程中有效避免了传统工艺中大豆蛋白等营养成分的流失,使对人体健康有益的纤维物质得到100%保留,无任何废弃物,可实现零排放、无污染、节能、节水、生产成本低、保质期长、产品质量易于控制等诸多优点,因而对推动豆制品产业化进程、提高经济效益和社会效益具有十分重要的意义。

当  $df=4$  时,  $t_{(0.05,4)}=2.776$ , 而  $t=0$ , 故差异不显著, 回归方程估计值与实际吻合, 回归方程成立。

因此, 由实验数据分析得出, 柠檬酸+酒石酸的复合配比最好。

### 3 结 论

(1) 不同亲水性物质降低低糖胡萝卜脯水分活度的能力不同, 用柠檬酸、酒石酸、单甘酯、乳酸钠进行试验, 结果表明, 酒石酸降低低糖果脯水分活度的能力最强, 酒石酸浓度在  $2.5\sim 20$  g/L 范围, 果脯水分活度  $<0.65$ , 为确保果脯具有良好的风味, 本文建议酒石酸浓度控制在  $10$  g/L 以内。

(2) 复合亲水性物质降低低糖胡萝卜脯水分活度的能力比单一使用时强, 且可以降低每种亲水性物质的使用浓度, 通过回归方程分析, 柠檬酸与酒石酸复合配比效果最好, 复合物总浓度  $>5$  g/L 时, 胡

萝卜水分活度  $<0.50$ , 并得出回归方程为:  $y=0.5118-3.600x$ 。但亲水性物质浓度大幅度增加会给加工工艺及产品质量带来不利因素, 为保证果脯有良好的风味, 本文建议使用柠檬酸+酒石酸复合物(柠:酒质量比  $=2:1$ )总浓度为  $5$  g/L, 此时低糖胡萝卜脯的总固形物为  $40\%\sim 45\%$ , 水分含量为  $18\sim 20\%$ 。

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## The Influence of Hydrophilic Material on Low-sugar Carrot Preserved Fruit Moisture Activation

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**ABSTRACT** This paper studies the influence of different hydrophilic materials including citric-acid, tartaric-acid, sodium lactate and monoglyceride on  $A_w$  of carrot low-sugar preserved fruit. The result showed that in the water concentration between  $18\%$  to  $20\%$ , the capabilities of these hydrophilic materials lowering the  $A_w$  of low-sugar carrot preserved fruit are different. The order of the capability from the strongest to the weakest is: tartaric-acid  $>$  citric-acid  $>$  sodium lactate  $>$  monoglyceride. The higher the concentration is, the stronger the capability of lowering the  $A_w$  of low-sugar preserved fruit is. The capability of using of these compound materials is stronger than any single component. And through the analysis of regression equation, showed that the citric-acid and tartaric-acid mixture is the best.

**Key words** hydrophilic materials,  $A_w$ ; compounded experiment, low-sugar preserved fruit

### 行 业 动 态

#### 发酵辣椒产品快速生产技术在京研制成功

“发酵辣椒产品快速生产技术”近日由中国食品发酵工业研究院研制成功。

“发酵辣椒产品快速生产技术”项目以中国食品发酵工业研究院岳国海等技术人员前期开发的“直投式生物泡菜快速生产工艺技术”为基础, 采用直投式复合菌粉产品, 创建了辣椒快速发酵生产技术; 项目创造性的改革了我国传统泡椒的生产方式, 采用复合菌粉技术确保了辣椒发酵生产用菌种的安全性和稳定性, 有效保障了发酵辣椒产品的食品安全性, 发酵辣椒产品的生产周期明显缩短, 生产效率极大提高。

采用生物技术生产的发酵辣椒产品最大限度地保留了辣椒的营养成分, 产品富含益生菌和乳酸; 产品具有口味酸辣柔和、风味独特的特点, 能增进食欲、帮助消化; 产品质量均一稳定、保存期长, 市场前景广阔。

“发酵辣椒产品快速生产技术”研制成功, 有效解决了传统泡辣椒生产存在的食品安全隐患问题, 提高了发酵辣椒产品的食品安全性; 项目投资灵活适合于辣椒产地就地建厂并可实现鲜辣椒的规模化加工生产; 项目技术可以有效提高我国辣椒深加工产业技术水平、提升辣椒产品档次、提高辣椒产品的附加值; 项目符合我国农产品深加工的产业政策, 该项技术具有广泛的推广应用价值。

中国食品发酵工业研究院已就项目产品和技术申报了国家发明专利。

# Determination of Pleuromutilin in Fermentation Broth by HPLC

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**ABSTRACT** A RP-HPLC method for the determination of pleuromutilin fermentation broth was developed. The fermentation broth was extracted by methanol and the extraction was analysed by HPLC. The sample was separated at temperature 25°C on a Shim-pack VP-ODSC18(5  $\mu$ m, 4.6 mm  $\times$  200 mm) eluted at a flow rate of 1.00 mL/min with mobile phase of methanol-0.1 mol/L  $\text{KH}_2\text{PO}_4$  (50:50, V/V), pleuromutilin was detected and quantified by the absorbance at 205 nm. The linearity was obtained over the range of 106.25~2500  $\mu$ g/mL for pleuromutilin with the coefficient being 0.9996 and the regression equation being  $y = 1790.3x + 145405$ . The average recovery was 96.5% and the detective limit was 3.28 ng. This method is simple, accurate, highly specific and reliable for the determination of pleuromutilin.

**Key words** pleuromutilin, HPLC, fermentation broth

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## Determination of Oligomeric Proanthocyanidins in Grape Seeds by RP-HPLC/ESI-MS

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**ABSTRACT** A method has been established for the identification of oligomeric proanthocyanidins in grape seeds using Reversed-Phase High Performance Liquid Chromatography /Electrospray Ionization Mass Spectrometry. The purified proanthocyanidins, which were extracted from grape seeds by 60% ethanol in water, were eluted by gradient  $\text{CH}_3\text{CN}$ -1%  $\text{CH}_3\text{COOH}$  in  $\text{H}_2\text{O}$  from ZORBAX SB-C<sub>18</sub> column. Mass detection was performed in the negative ion mode. According to the mass of charged quasi-molecular ion  $[\text{M}-\text{H}]^-$ , Three monomers, eight dimers, four monogalloylated dimers and four trimers were identified. At the same time, we have discussed the proposed ESI-MS fragmentation pathways of proanthocyanidins.

**Key words** proanthocyanidins, RP-HPLC, ESI-MS, grape seeds

行业动态

### 彪拉克(PVRAC)公司在泰国兴建亚洲最大的乳酸厂

世界上最大的乳酸厂荷兰彪拉克公司目前正在泰国兴建亚洲最大的乳酸厂。因为可利用泰国廉价而丰富的木薯等原料,故预期市场竞争力极强,初期投资为 130 亿日元,2008 年初完成年产 10 万 t 的生产能力。原先该公司的荷兰本部加上西班牙、法国、美国(与嘉吉公司合资)的分厂,届时总产量可达 20 万 t 之多,将是目前产量的 1.5 倍。而首先进入亚洲(中国)的日本武藏野化学研究所、比利时加拉古特与中国 BBKA 公司合资的 B.G 公司则分别次之。

乳酸及其衍生物的应用领域很广,世界市场正以每年 10% 的速度增长,估计需求量达 25~28 万 t/年。因美国农业部等对付里斯特菌而推行在畜肉制品中添加乳酸钠,致使市场需求急增,再因从环保需要的角度考虑,利用植物性塑料(聚乳酸)原料制作的器具将会额外引人注目,特别是精制乳酸,在亚洲中国、印度等发展中国家,在食品加工,营养强化食品领域以及医药中间体,半导体工业等的市场发展潜力很大。该公司选择在泰国开设第 5 个生产基地,正是瞄准亚洲经济增长的全球战略的重要一环。