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Fermentation Optimization for High Content β -Glucan of *Saccharomyces cerevisiae*

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ABSTRACT In order to enhance the content of *Saccharomyces cerevisiae* β -glucan (SCG), incubated conditions of *Saccharomyces cerevisiae* were optimized in this study. The main incubation conditions were determined by single factor experiments. The optimized incubated conditions such as pH5, inoculation size 6 mL, temperature 32°C, media volume 40 mL, were confirmed by orthogonale experiment design. β -glucan content was increased to 140.3 mg/100 mL under the optimized conditions. Variance analysis showed that the production of SCG was affected significantly by media volume ($P < 0.01$), the influence order was media volume > original pH > temperature > inoculation size.

Key words *Saccharomyces cerevisiae*, β -glucan, incubated condition

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日本一奶制品公司开发出低胆固醇奶制品

日本研究和开发营养食品的 EugeneScience 公司宣布,北海道最大的一家的奶制品企业 Yotsuba 研制出了一种胆固醇含量很低的酸奶制品。该公司成立于 1967 年,拥有 630 名员工,目前的年销售额可以达到 7.7 亿美元,生产的奶制品主要包括:牛奶、黄油和奶酪。

日本的大部分零售商店和超级市场都可以看到该公司的产品。EugeneScience 公司的 CEO SeungKwonNoh 称,随着消费者对健康程度的关注越来越高,食品公司也在不断的开发研制那些符合消费者需求的产品,而日本也成为世界上健康食品和保健食品最为丰富的地区。Yotsuba 是一件潜力很大的公司,他们能够很好的帮助消费者建立对健康奶制品的认识,尤其是这种胆固醇含量很低的奶制品。

高、纯度高、蛋白质含量低等特点,是从酵母自溶残渣中提取 β -1,3-*D*-葡聚糖的理想途径。

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Extraction and Physical-chemical Properties of Glucan from *Saccharomyces cerevisiae*Huang Guohong^{1,2}, Li Kede¹, Zeng Qingxiao¹

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ABSTRACT The technology for extracting the β -1,3-glucan from *Saccharomyces cerevisiae* by enzyme-alkali method was studied in this paper. We added 1600IU per gram yeast cell wall of alcalase and incubated for 3 hours at pH 8 and 60 $^{\circ}$ C, then the precipitate was scattered with 60 mL 2% NaOH and water-bathed 6 hours at 75 $^{\circ}$ C. The glucan was dried by the vacuum freeze-drying. We found that the yield of the final product was 21.38% and the content of polysaccharide, protein and moisture were 92.17%, 1.32%, 5.53%, respectively. The polysaccharide components were analyzed by Infrared spectra. The results indicated that the product of β -1,3-glucan has high-purity.

Key words *Saccharomyces cerevisiae*, glucan, enzyme-alkali method, extraction

会
讯

中国国际玉米产业发展论坛将在长春举办

作为 2007 中国国际玉米产业博览会重要配套活动,中国国际玉米产业发展论坛也将于 2007 年 9 月 23 日在长春国际会展中心同期举办。

中国国际玉米产业发展论坛是首次由我国国家主管部门、玉米行业中介组织和玉米主产地政府部门联合举办的玉米专题研讨盛会,会上将着重探讨“国家十一五”规划与中国玉米产业实现可持续发展的战略和对策等有关问题。届时,国家发改委、国家粮食局等行政主管部门的领导,吉林省、长春市政府部门的领导,国家粮油信息中心、中国粮食行业协会、发酵协会、淀粉工业协会等机构专家,玉米产业资深专家、国内外知名玉米企业高层管理人员将在论坛上作重点发言。众多来自玉米品种研发、种植、收储、检验仪器设备、深加工、饲料、机械设备、物流等产业链各端相关企业代表将齐聚长春,在我国玉米产业宏观政策面临重新调整和全面规划的关键时期,共同探讨玉米市场形势,共商可持续发展战略。该论坛的组办,必将对推动我国玉米产业的整体开发、产业化经营和我国玉米产业的良性发展发挥积极作用。

本届论坛专题报告有:(1)中国玉米产业健康发展与建议;(2)中国玉米产业的政策引导与行业服务;(3)玉米深加工与保障粮食安全;(4)2007~2008 年度中国玉米市场分析;(5)玉米进出口现状及前景;(6)美国玉米深加工发展概况;(7)塑造品牌形象、弘扬玉米文化;(8)玉米发酵工业的概况;(9)玉米淀粉工业的概况;(10)玉米科学储藏;(11)关于建立玉米产业发展基地的战略思考。

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道康宁将参加 2007 中国国际工业表面活性剂及国际水处理化学品展览会

2007 第二届中国国际工业表面活性剂及国际水处理化学品展览会将于 2007 年 10 月 22~23 日上海世贸商城举办。届时,道康宁将向与会者展示其有机硅聚醚表面活性剂产品和有机硅消泡剂系列产品在各种工业领域应用的最新技术信息,以及产品服务和其他能够帮助客户创新和增加业绩的解决方案。

在展会同期的研讨会上,道康宁公司中国功能化学品部技术服务杨海波经理,还将在针对有机硅产品的独特特性向专业观众陈述论题为“琴瑟之和——道康宁有机硅与表面活性剂的完美结合”的报告。

欢迎您届时莅临道康宁的展位,展位号:1A040—1A041。如果您无法莅临此次展览,您可以访问我们的网站 www.dowcorning.com.cn/chemicals 或致电道康宁技术信息中心:+86 21 3774 7110 了解更多产品和技术信息。

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Research Progress in Production of *L*-carnitine by Method of Bioconversion

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ABSTRACT The progress in research of production of *L*-carnitine by the method of bioconversion from achiral precursors was reviewed, including the screening of bacterial strains, the optimization of process, the metabolic pathways in biosynthesis and the downstream technology, etc. Taken together, the main problems and future direction in research was proposed and run as follows: (1) To bioconversion from crotonobetaine, it's essential to enhance the conversion rate and acquire more economical and efficient techniques of separating *L*-carnitine from crotonobetaine. (2) To bioconversion from γ -butyrobetaine, it's essential to reduce the cost of culture media and the time of a bioconversion cycle. (3) To reduce the cost of separation and purification of product, it's essential to acquire cheap precursors whose physical or chemical properties far from *L*-carnitine.

Key words *L*-carnitine, production, bioconversion, research progress

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欧洲计划开发新型无糖酸奶甜味剂

欧洲著名的食品添加剂公司 Nutrinova 计划开发出了一一种新型的无糖酸奶甜味剂,该甜味剂能够帮助奶制品生产商生产出质量更好的酸奶,来满足消费者对酸奶甜味口感的需求。

公司将该研究委托给了独立的研究机构 Lintech RSSL,首先试验的产品是无糖的草莓味道的酸奶。公司称,目前在奶制品市场上,消费者对口感的要求越来越高,而且他们也不愿意放弃对健康的追求,因此低糖或者无糖的酸奶制品越来越受到人们的喜爱。公司没有透露新的甜味剂的成份,只是暗示,将会由三种不同的甜味剂混合(Sunett, aspartame 和 sucralose)生产出一种接近于天然糖口味的添加剂。生产出来之后,将会有十位专家对其味道进行评判,评判的方面主要包括:甜味的骨架,人工合成味道,回味,稠密度以及苦味。

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Combination of Solid-phase Microextraction and Simultaneous Distillation Extraction Methods with GC to Analysis of Aroma Components in Parma Ham Flavor

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ABSTRACT 99 compounds were identified for the Parma ham extracted by the simultaneous distillation and the solid-phase micro extraction methods with GC, most of them are aldehydes and alcohols, others are ketones, esters, acids, hydrocarbons, sulphur and circle compounds were also identified. Aldehydes and alcohols contribute much to the Parma ham flavor. The effect of the two methods on the volatile compounds were compared. The main compounds were Hexadecanal, Ethyl acetate and Hexanal, 3-Methyl-butanol, 3-Hydroxy-2-butanone by SDE and SPME respectively. Nine compounds identified in this study have not been previously reported, for example, Hexadecadienoic acid, Methyl ester, 4-Methyl-phenol, 6-Methyl-1-octene etc.

Key words Parma ham, flavor, SDE, SPME

信息窗

E85 改性乙醇燃料研发成功

北京中天醇能源技术有限公司开发成功不添加汽油的 E85 改性乙醇清洁燃料,该产品具有高效、环保、安全的优点。将它作为替代石化燃料的清洁能源进行推广,可以大幅度降低汽车尾气中二氧化硫和氮氢化合物等有害物质的排放,为有效减少空气污染提供了理想选择。

E85 改性乙醇清洁燃料是以工业乙醇为主要成分,针对乙醇的理化性能,将专门的改性剂添加其中,对乙醇进行复配改性得到的新型汽车燃料。此外,在该燃料中还要添加防腐剂、抗爆剂等功能性添加剂,用以提高改性乙醇燃料的热值、抗爆指数和动力性能,同时降低其对汽车部件的腐蚀。山东省环境监测中心的检测结果显示,使用 E85 改性乙醇清洁燃料的车辆,尾气排放的各项指标均优于 93# 汽油,具有环保、安全、无腐蚀、动力强等优点。

专用改性剂的研发和应用是制取 E85 改性乙醇清洁燃料的核心技术。目前,该公司完成的乙醇改性剂及其应用技术成果,已通过国家专利局的专利初审。

E85 改性乙醇燃料的生产可在常温、常压的环境下进行,工艺简单,作业安全,整个过程无三废产生。据环保部门监测,目前北京市的空气污染有 60%~70% 是汽车尾气引起的。E85 改性乙醇燃料的尾气排放指标优于乙醇汽油,可望有效解决各大城市面临的尾气污染难题。

据悉,北京中天醇能源技术有限公司已在山东省齐河县建设了研发和生产基地——山东齐翔能源有限公司,目前正在实施车用改性乙醇燃料项目的改扩建工程。该项目总投资约 1.6 亿元,扩建完成后将具备年产 20 万 t 改性乙醇清洁燃料和 5 万 t 改性甲醇燃料的能力。

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Studies on some Active Components of Fermentation Condition in *Hymenostilbe sphecoptila* Kob HS01

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ABSTRACT The content of extracellular polysaccharide, nucleosides and the amino acids produced by *Hymenostilbe sphecoptila* in the fermentation were analyzed. The results showed that the highest contents of the extracellular polysaccharide of *Hymenostilbe sphecoptila* could reach 1.75 g/L and the intracellular one could reach 2.423%. There were five kinds of nucleosides including uridine, guanosine, inosine, thymidine and adenosine both in mycelia and in the extract of HS01. Each kind of the nucleoside content in *Hymenostilbe sphecoptila* was higher than that in the *Cordyceps sinensis*. There were no differences in the kind of amino acids between HS01 and general *Cordyceps sinensis*, but the total amino acids and essential amino acids in HS01 was higher than that in *Cordyceps sinensis*. The total content of amino acid was 8.330 mg/g in HS01.

Key words *Hymenostilbe sphecoptila*, polysaccharide, nucleosides, amino acids

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美国生物技术有望解决甘油过剩问题

美国生物柴油生产不断增多,并且有大量新的生物柴油装置正在建设之中,而生物柴油工业面临生物柴油生产的副产物甘油过剩的问题。每生产 10g 生物柴油就会产生 1g 甘油。美国 Rice 大学的新发现可望解决这一问题,研究人员提出用细菌使甘油发酵并生产另一种常用的生物燃料乙醇。

研究人员已鉴定了新陈代谢过程和条件,使用称为 *E. coli* 的菌株可将甘油转化为乙醇。而且过程颇为高效。据估计,该操作成本比从谷物生产乙醇的方法要低约 40%。

在生物转化过程中,研究人员使微生物工程化,可吃掉特定的化学原料,并分泌出某些有用的物质。许多药物就采用此方法制取。化学加工工业采用生物加工可使过程成为“绿色化”,应用正在增多,而且成本可低几倍,可以替代化学加工。

研究指出,仅有很少数的微生物可在缺氧环境中消化甘油。这种缺氧过程称之为厌氧发酵,将它用于生物转化是最为经济而又可广泛应用的过程。

研究人员发现,使用 *E. coli* 菌株在厌氧条件下,可从甘油生产乙醇和其他产品,与采用常规的糖基原料如葡萄糖和木糖相比,其产率高,而且成本低。

农业工程学报, 2007(待刊)

Studies on the Purification of Polyphenols from Tea Plant Flower by Ultra-filtration

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ABSTRACT The ethanol extract of tea plant flower polyphenols was purified by ultra-filtration (UF) in different conditions. The optimal UF parameters were found to be a membrane assembly with a weight molecular cut-off 20-50 ku, an operation temperature at 30°C, under a filtration pressure of 0.10 MPa. The initial polyphenol concentration was 4.0 mg/mL, while the later stage of UF separation was enhanced by addition of water for dialysis. The UF separation retained 73.94% of proteins in the extract. This increased the absorption capacity of the absorbent resin by 35.8% during the following stage. Therefore, the purity of the polyphenols after resin adsorption reached 84.3% for the UF treated extract, compared to 32.8% for the extract without UF. The HPLC chromatograms also showed that catechins were sufficiently enriched after UF, indicating the efficiency of UF treatment for purification of polyphenols by absorbent resins.

Key words tea plant flower, polyphenols, ultrafiltration

市场动态

日本对奶制品的需求不断增加

日本对乳清粉的需求量不断增加,这使得美国的奶制品出口量不断地增加。而美国也有这个能力向日本源源不断的提供乳清粉。在2006年美国的乳清粉出口创下了新高,达到7.66亿英镑,而从目前的情况来看,2007年的乳清粉出口量将会打破2006年记录。同时,乳清粉的成功也为美国整个奶制品的出口作出了不小的贡献,日本1.27亿居民对健康的要求越来越高,促使他们对一些具有保健功能的牛奶成分越来越感兴趣,推动了美国的奶制品出口。同时对美国奶制品生产商来说,国外市场非常重要。

芝加哥的奶制品市场分析师 MaryLedman 称,日本人和美国人一样,对健康奶制品的追求越来越甚,而我们也可以了解到他们最想要的是什么,因此我们可以很好的满足他们的需求。

信息窗

美国科学家可在实验室制造出全新酶

美国哈佛大学附属医院马萨诸塞州总医院的研究人员在最近出版的《自然》杂志上发表报告称,他们第一次证明,无须详细了解酶的工作机理,就可以在实验室中制造出全新的酶。

迄今为止,酶的唯一来源是生物,科学家花了很大精力来修饰和改进自然酶。但他们的研究证明,在实验室制造全新酶的潜力巨大。

索塔克实验室已经发明了一种 mRNA 展示技术,可以识别和放大符合特定标准的蛋白质。为了制造出能催化两个核糖核酸(RNA)片段结合(这种结合不会自然发生)的酶,索塔克和他的同事博克哈特·西利格博士首先生成了一个包含4万亿个小蛋白质的库,这些蛋白质在序列上有微小变化。然后,他们使用 mRNA 展示技术,把每个蛋白质同这两个 RNA 片段连接,这样的 RNA 片段又称为 RNA 基质。

如果某个特定的蛋白质能促使 RNA 基质结合,产生一个更大的分子,那表示这个蛋白质是活跃的酶。研究人员进而可以挑选出更大的 RNA 链,产生更多的酶,然后再不断重复实验。通过引入随机突变产生不同形式的酶,以及减少剪接反应的时间,研究人员可以利用制导进化手段培养出更有效的酶。

研究人员目前得到的酶的版本仍然很小,并且不太稳定,但这个实验可以启发科学家采用其他策略来改进酶的活性。

酶是一种专门促进分子间化学反应的分子,蛋白质和其他化学物质复杂精细的反应,都要求有酶的参与。索塔克表示,全新酶的制造将有助于改进化学物质和药物合成,有助于为分子生物研究设计新的工具,也有助于找到新的疾病治疗方法。