

Author's Accepted Manuscript

A new age-based replenishment policy for supply chain inventory optimization of highly perishable products

Qinglin Duan, T.Warren Liao



www.elsevier.com/locate/ijpe

PII: S0925-5273(13)00247-8
DOI: <http://dx.doi.org/10.1016/j.ijpe.2013.05.020>
Reference: PROECO5469

To appear in: *Int. J. Production Economics*

Received date: 25 December 2012
Accepted date: 16 May 2013

Cite this article as: Qinglin Duan, T.Warren Liao, A new age-based replenishment policy for supply chain inventory optimization of highly perishable products, *Int. J. Production Economics*, <http://dx.doi.org/10.1016/j.ijpe.2013.05.020>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A new age-based replenishment policy for supply chain inventory optimization of highly perishable products

Qinglin Duan, T. Warren Liao*

Department of Mechanical and Industrial Engineering, Louisiana State University, Baton Rouge, LA 70803

*Corresponding author. Tel.: +1 225 578 5365.

Email: ieliao@lsu.edu

Abstract

A simulation optimization framework is proposed for supply chain inventory management of highly perishable products. A new replenishment policy based on old inventory ratio is developed, hence called OIR policy. It is an age-based policy using only partial age information to measure the freshness of the entire inventory. The efficiency of the new policy is evaluated in detail for a single-vendor-multi-buyer platelet (with a limited shelf life of 5 days) supply chain. The inventory objective is to minimize the expected system outdate rate under a predetermined maximal allowable shortage level. The new OIR policy is compared with two existing order-up-to policies: one is the order-up-to policy without age consideration; the other one is the "EWA" policy developed by Broekmeulen and van Donselaar (2009). The three policies are compared under both decentralized and centralized controls for different levels of the fill-rate constraint. The computational results show that adopting centralized control over the whole platelet supply chain greatly helps reducing the system expected outdate rate from 19.6% down to 1.04% on average while keeping sufficiently high fill rate at each entity. The two policies with age consideration are generally better than the policy without age consideration under both control strategies. This is particularly true for decentralized control. The new OIR policy is recommended because it is the best among all three, consistently yielding good results in all cases studied.

Highlights

- This paper proposes a new age-based replenishment policy called the old inventory ratio policy.
- It develops centralized & decentralized models for a SC of highly perishable.
- It solves the models with simulation optimization methodology to determine optimal policies.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات