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Application of stochastic programming to reduce uncertainty in quality-based supply planning of slaughterhouses. (English) Zbl 1337.90048

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Summary: To match products of different quality with end market preferences under supply uncertainty, it is crucial to integrate product quality information in logistics decision making. We present a case of this integration in a meat processing company that faces uncertainty in delivered livestock quality. We develop a stochastic programming model that exploits historical product quality delivery data to produce slaughterhouse allocation plans with reduced levels of uncertainty in received livestock quality. The allocation plans generated by this model fulfil demand for multiple quality features at separate slaughterhouses under prescribed service levels while minimizing transportation costs. We test the model on real world problem instances generated from a data set provided by an industrial partner. Results show that historical farmer delivery data can be used to reduce uncertainty in quality of animals to be delivered to slaughterhouses.

MSC:

90C15 Stochastic programming

90C90 Applications of mathematical programming

Cited in 1 Document

Keywords:

supply chain; uncertainty; food supply chain networks; stochastic programming; allocation planning; quality controlled logistics

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