

and transportation according to the rules of transportation by different kinds of transport. For decades during the USSR existence and in Russia the predominant vehicle for canned fish products – the universal covered railway wagon (UCRW). «Rules of perishable cargo transportation by railway» (edition 2003) of the Company «Russian Railways» restrict for UCRW the transportation of «canned fish and crab» in summer period, except June, July and August. In summer temperature of environmental air and therefore temperature in wagon can differ essentially from parameters, declaring by producer, as storage conditions: day temperature meanings can reach 55–58 °C.

Under the politics of technical regulation the producer (consigner) is responsible for quality and safety of food production, including transportation. Developing market, variety of consigners, large quantity of railway service operators demand accurate and responsible regulation of transportation regimes. Proposed conceptual scientific approach to enough argumentation of canned fish transportability is based on confirmation of reserve of quality and food safety stability of product until expiration date after modeling, proving of test transportation by real possible time schemes of daily variation of air temperature (till limit values), considering a kind and state of raw material, package and quality specificity of product line group. Results of scientific and practical substantiation (on corporative and/or co-operative principles) of regulations concerning canned fish transportation in UCRW seem as the sufficient basis for realization in private and branch technical documents.

Упаковка на основе EVOH (SOARNOL) с высокими барьерными свойствами для увеличения сроков годности продуктов питания

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По данным британской полимерной федерации [Thermoformed packaging 2009, by BPF], в развивающихся странах потери продуктов питания на пути к столу потребителя достигают 50%. В странах Западной Европы эта цифра не превышает 3%. Большая часть потерь происходит из-за неправильной упаковки продукции при транспортировке и хранении.

На сегодняшний день, технологические решения в области упаковки, позволяющие увеличить срок годности продуктов питания, очень важны и для народного хозяйства России. К сожалению, зачастую потеря продукции при хранении компенсируется стоимостью и является причиной столь высокого соотношения цены к качеству в наших магазинах.

Одной из самых распространенных технологий для увеличения срока годности продуктов питания – это полимерная упаковка с использованием EVOH (SOARNOL). Материал EVOH (SOARNOL) является сополимером этилена и винилового спирта и обладает уникальными барьерными свойствами к газам (O₂, CO₂, N₂). Барьерные свойства EVOH (SOARNOL) к кислороду выше в 100 раз,

чем у полиамида, и в 25000, чем у полиэтилена высокого давления. По своим барьерным свойствам EVOH приближается к традиционным материалам консервации продуктов: жести, стеклу и алюминиевой фольге. Кроме того, EVOH-упаковка прекрасно удерживает вещества, отвечающие за аромат продукции.

EVOH-упаковка представляет собой многослойную систему материалов, как правило состоящей из 3, 5, 7 или 9 слоев. На основе материала EVOH (SOARNOL) производят самую разнообразную полимерную упаковку: пленки, лотки, банки и бутылки.

Packaging based on EVOH (SOARNOL) with high barrier properties aimed to increase the foods lifetime

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According to the data provided by the British Polymer Federation [Thermoformed packaging 2009, BPF], the losses of foods on their way from a production site to customers' tables are up to 50% in the developing countries. At the same time in the countries of Western Europe these losses do not exceed 3%. The most significant part of foods' losses occurs due to improper packaging during transportation and storage.

Nowadays the technological solutions in the field of packaging which allow to increase the lifetime of foods are very important for Russian national economy. Unfortunately foods losses during the storage are often compensated by the cost and are the reason of the high price-quality ratio in stores.

One of the most common technologies in the area of foods' lifetime increase is using polymer packaging based on EVOH (SOARNOL) material. EVOH (SOARNOL) material is ethylene ad vinyl alcohol copolymer. This material has unique barrier properties in respect of gases (O_2 , CO_2 , N_2). The barrier properties EVOH (Soarnol) in respect of Oxygen is 100 times higher than those of polyamide, and 2500 times higher than those of LDPE. Taking into consideration the barrier properties of EVOH, this material is almost similar to the traditional materials used for foods conservation, i.e. tin, glass and Al foil. Besides, EVOH-packaging perfectly retains substances responsible for foods' flavor.

EVOH-packaging is the multilayered system of materials consisting as a rule of 3, 5, 7 or 9 layers. Various types of packaging (films, trays, cans or bottles) are produced on the basis of EVOH (Soarnol).