Lecture 14. Transport and cargo complexes for perishable goods.

Purpose of the lecture: development of generalized solutions to the problem, analysis of these options, forecasting the consequences, finding compromise solutions in conditions of multi-criteria, uncertainty;;

Keywords: storage operations, isothermal rolling, warehouses, retail trade enterprise

Types of lectures : Lecture-explanation.

14.1. Transport characteristic of perishable goods

14.2. Conditions for the transportation and storage of perishable goods.

14.3. Refrigerated warehouses in logistics systems

14.1. Transport characteristic of perishable goods

According to their transport and storage characteristics, perishable goods are similar to tare-piece cargoes. Therefore, most of the transportation methods, organization and mechanization of loading, unloading, transport and storage operations (PRTS works) and the creation of transshipment and storage complexes for unit cargoes are also applicable to perishable goods. The difference lies in the special temperature and humidity conditions under which these goods must be transported, processed and stored in transport-cargo complexes.

These features are highlighted in this chapter. PRTS work with bulk and liquid perishable goods is not considered here. Perishable goods mainly include agricultural products and processing enterprises of the agro-industrial complex.

Most perishable goods are transported and stored at a moisture content of 80 ... 95%. In case of violation of the regulatory temperature and humidity conditions, perishable goods may lose their quality. The main types of damage to different cargo groups are as follows:

for meat - the appearance of mucus, mold, pigmentation (the appearance of spots), sour fermentation (gray color and sour smell), tan (change in smell and color inside the carcass), rot;

on fish - clouding of mucus, gray color, putrefactive odor, discoloration of gills; tanning (spoilage of meat at the spine), puff (putrefactive breakdown of protein), chubby (bloating of the abdomen) - in salted fish;

oily - musty taste, mold, pigmentation (stains), shtaff (change in taste and color on the surface);

for cheese - bloating, putrefactive odor, mold;

for vegetables and fruits - rot, botritis (a mushroom that enhances decay), penicillium (wet rot), trichoseptorium (bitter rot).

14.2. Conditions for the transportation and storage of perishable goods.

Perishable goods are transported in special isothermal rolling stock of railway transport and in refrigerated vans. Thermos cars, refrigerator sections of 5 cars, autonomous refrigerator cars (ARVs) are used for transporting these goods by rail: see table. 14.3 and fig. 14.2. Previously, refrigerated trains from 21 and 23 wagons and refrigerated sections from 12 wagons were also used, but in the 1980s. they were discontinued due to their technical and operational shortcomings,

and also due to the difficulty of loading entire trains with perishable goods following the same route.

14.3. Refrigerated warehouses in logistics systems

Refrigerated warehouses are important elements of the logistics chains for the delivery of perishable goods for processing and to final consumers. They also play an important role for maintaining the standard temperature and humidity conditions during storage and processing of these goods as elements of a continuous refrigeration chain.

The following types of refrigerated warehouses are available in these supply chains:

- warehouses of finished products of enterprises engaged in harvesting or fishing (for fish and fish products) and primary processing of food raw materials and agricultural products (harvesting refrigerators). In the fishing industry, these primary warehouses are located on refrigerated trawler ships and floating depots;

- transshipment refrigerated warehouses in seaports, designed for transshipment of perishable goods from sea to land modes of transport (and sometimes for their temporary storage);

- Logistic terminals with refrigerated warehouses, used to organize perishable cargo flows to other regions of the country;

- trade refrigerated warehouses (formerly called sales refrigerators), which are used to organize the flow of perishable goods from the main transport to the retail distribution network;

- warehouses of agricultural raw materials at the enterprises of the agro-industrial complex (food industry), from which the technological process of processing agricultural products begins;

- refrigerated warehouses of finished products of food industry enterprises;

- refrigerated warehouses in retail trade enterprises (in stores);

- customs refrigerated warehouses and customs warehouses-refrigerators of temporary storage.

Questions:

1. What goods are perishable?

2. Why should perishable goods be transported in refrigerated rolling stock?

3. What is the most rational way to transport perishable goods?

4. What are the main features of refrigerated warehouses?

Literature and resources

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4. 4. Complex mechanization and automation of loading and unloading operations: Textbook / Ed. Timoshina A.A. and Machulsky I.I.-M .: Route, 2013.- 400 p.

Internet resources:

1. Abdikerimov, G.S. Logistic management of cargo transportation and terminal and warehouse activities [Text]: A textbook for specialists / G.S. Abdikerimov, S.Yu. Eliseev, V.M. Nikolashin, A.S. Sinitsyna, O.B. Malikov // M: FGBOU "Educational-methodical / center for education in railway transport". - 2013 .-- 428 p. https://e.lanbook.com/reader/book/59016/#1

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3. Design of loading and unloading devices and warehouses: Method. instructions / compiled by V.A. Bolotin, E.K. Korovyakovsky, N.G. Yankovskaya.- SPb.: FSBEI HPE PGUPS, 2015.- 38 p.

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