



11. 16 березня 2011 року у Верховній Раді України відбулися парламентські слухання на тему: «Сучасний стан та актуальні завдання подолання наслідків Чорнобильської катастрофи» / Офіційний сайт Верховної Ради України [Електронний ресурс]. – Режим доступу : [http://portal.rada.gov.ua/news/Novyny/Parlamentski\\_slukhannya/39772.html](http://portal.rada.gov.ua/news/Novyny/Parlamentski_slukhannya/39772.html).

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УДК 347.463

## FEATURES TRANSPORTATION OF PERISHABLE LUGGAGE

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#### Summary

In the article an author researches the nowadays state of the perishables transportation in Ukraine by national automobile and railway transport. The analysis of legislative acts which regulate the automobile and railway perishables transportation is made. The author classifies the main list of perishables transported by automobile transport and railway rolling stock, finds discordances in conditions of transportation of such loads by automobile and railway transport. The volumes of production and consumption of perishable foodstuff in Ukraine in export and import communication, the nowadays volumes of the perishables transportation in Ukraine are also researched. The expediency to use automobile and railway transport for the perishables transportation depending on the distance of transportation is analysed.

**Key words:** automobile and railway transportation, perishables, rolling stock, transportation, refrigerator.

### ОСОБЕННОСТИ ПЕРЕВОЗКИ СКОРОПОРТЯЩЕГОСЯ БАГАЖА

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#### Аннотация

В статье рассмотрено современное состояние перевозок скоропортящихся грузов в Украине с участием отечественного автомобильного и железнодорожного транспорта. Проведен анализ нормативно-правовых документов, регулирующих автомобильные и железнодорожные перевозки скоропортящихся грузов. Классифицирован основной перечень скоропортящихся грузов, транспортируемых автомобильным транспортом и железнодорожным подвижным составом, выявлены расхождения в условиях транспортировки иданных грузов на железной дороге и автотранспорте. Также проанализированы объемы производства и потребления скоропортящихся пищевых продуктов в Украине в экспортно-импортном сообщении. Исследованы современные объемы перевозок скоропортящихся грузов в Украине. Проанализирована целесообразность использования в перевозке скоропортящегося груза автомобильного и железнодорожного транспорта в зависимости от расстояния перевозки.

**Ключевые слова:** автомобильно-железнодорожные перевозки, скоропортящиеся грузы, подвижной состав, транспортировки, рефрижератор.

#### Formulation of the problem.

Daily growth of production of perishable foodstuffs that requires keeping the relevant transportation conditions and minimum delivery timelines leads to a dense competition as between producers of these products, as between carriers. Considering that only qualitative and delivered in time product can be competitive, the delivery process should meet such logistics

conceptions as: “just in time” and “door to door”. Competition between railway and automobile transport consists in their advantages, namely in high-volume deliveries and relative cheapness of the railway transport and manoeuvrability of the automobile one. However, considering such important factor as a distance of transportation, it is not always beneficial to deliver perishables by only one kind of transport. An extensive railway network



is able to transport perishables to the most populated settlements of Ukraine and outside its borders, but in order to deliver load directly to the distribution network or small enterprises with no access to tracks it is necessary to bring in manoeuvrable automobile transport. In such case automobile and railway transport is not competitors but partners that is profitable for each link of logistics chain “production – transportation – consumption”. Thus, at present stage of national transport system development it is really important to research nowadays state of the perishables transportation by automobile and railway transport taking into account the distance of transportation of loads, that in future will contribute to the development of measures to improve the efficiency of their interaction during the perishables transportation.

To improve the efficiency of interaction between automobile and railway transport during the perishables transportation it is necessary to:

- 1) research nowadays state of the perishables transportation in Ukraine;
- 2) analyse volume of production and consumption of foodstuffs in Ukraine;
- 3) research prospects of further export-import relations of Ukraine with CIS and European countries where the domestic transport potential will be involved;
- 4) analyse the distances of the perishables transportation by automobile and railway transport.

**Analysis of publications.** The following native scientists researched the issue of improving the efficiency of organizing the transportation of loads by automobile and railway transport: Bogomolova N.I., who researches organizational and economic development of railway refrigerated transportation; Moskvitina T., who researches administration of the perishables traffic on the basis of logistics; Davidich Y.O. and Ponkratov D.P., who research division of load types between automobile and railway transport. Also we have to consider such Russian scientists as: Zhuraboyev K.A., who researches ways of improving the perishables transportation by the logistics chain adjustment; Myronenko V.K., Shapovalenko M.M. and others. However, the analysis of publications has shown that attention is mostly focused on organization of the perishables transportation by automobile or railway

rolling stock, but such issue as interaction between these kinds of transport during the perishables transportation has not been researched yet.

**Purpose of the article** is to research the state and requirements to the perishables transportation by automobile and railway transport, and to work up measures to improve interaction between automobile and railway transport during the perishables transportation.

**Main results of the research.** The perishables transportation by railway and automobile transport has its specific features regulated in accordance with subordination of transport equipments: by railway transport – in accordance with the Rules of the Perishables Transportation (Article 5 of the Statute of Railways of Ukraine) [1], the Rules of Transportation of Loads in Universal Containers, the Rules of Transportation of Loads in Special and Specialized Containers of Consignors and Consignees; by automobile transport – in accordance with the Rules of Transportation of Loads by Automobile Transport in Ukraine [2]; under the international treaties of Ukraine, the Civil Code of Ukraine, the Laws of Ukraine “On Transport”, “On Automobile Transport” and other legislative regulatory acts of Ukraine.

The Agreement on the International Transportation of Perishable Foodstuffs and on the Special Equipment to be Used for such Transportation (ATP) dated September 1st, 1970 is also effective for Ukraine (Ukraine joined to it on April 2nd, 2007). In accordance with the Rules of the Perishables Transportation, on railway transport the perishables means loads which require protection during its transportation (cooling, ventilation, heating) from the influence of high or low ambient air temperatures.

The way of the perishables transportation (cooling, ventilation, heating or in the “thermos” mode) and type of wagon or container (universal or refrigerator) is determined by the consignor depending on the perishables nature and climatic conditions throughout its transportation route. Under the Rules of Transportation of Loads by Automobile Transport in Ukraine on automobile transport the perishables are food and other loads, transportation of which should be done in appropriate environment and with appropriate temperature. The perishables

are transported by automobile transport in cooled, chilled, frozen, quick-frozen state and in a fresh look taking into account the terms of their sales and distance of transportation. During the perishables transportation by automobile transport they use specialized and universal (general) designation transport equipments. The main groups of perishables transported by railway transport include products of plant origin, animal origin, derivative products, plants, medical and biological products, drinks, farinaceous and cream products and other loads that can be carried only in accordance with separate contracts between the consignor and railway under special conditions determined by Ukrzaliznytsya [1].

The main groups of perishables transported by automobile transport include products of plant origin, animal origin, derivative products, plants, medical and biological products, live fish material for squid, farinaceous and cream products [2, 3]. However, unlike the railway transport, on automobile transport the perishables list does not include some perishables (they considered as so in accordance with [1]).

Such loads include drinks, bees in hives, latex (liquid caoutchouc), caoutchouc in blocks. As the above mentioned loads are transported by automobile transport in large quantities, it is necessary to clarify the types of rolling stock used for transportation of these loads by automobile and railway transport. It will allow to reduce a risk of damage of such products. Also the difference in using the types of rolling stock to transport the loads by automobile and railway transport is possible depending on the distance of transportation and time of year.

For example, on railway transport the transportation of fresh greens (lettuce, radishes, green onion, dill, etc.) is done in isothermal or refrigerated rolling stock; and on automobile transport it can be transported in automobile transport equipment of general purpose at night or in morning (up to 8 a.m.) with a duration of transportation less than 3 hours.

According to the State Statistics Service of Ukraine [4] nowadays there is a gradual increase of foodstuff production that requires keeping of special conditions of transportation.

Also, during recent years there is a significant increase in the consumption of



basic foodstuffs by population of Ukraine (namely: meat and meat products, milk and milk products, eggs, vegetables and melons food products, fruits, berries and grape (excluding production of wine), fish and fish products, oil.

During the analysis of volumes of production and consumption of the perishable foodstuffs of four types (oil, meat, milk, eggs) in Ukraine in 2016 they founded that it is possible to fully meet the needs of Ukraine in such products as oil, milk and eggs, and even export them. Instead, they revealed lack of meat products and need in their import.

As similar trends of increasing the production and consumption of different groups of the perishable foodstuffs are observed in the CIS countries [5], we can make a conclusion on improvement and gradual increase of trade and transport relations between Ukraine and the CIS countries in the future.

The dynamics of commodity structure of export and import of Ukraine with the EU countries is also positive. Import of perishables is still exceeding there, but we may see a significant increase in export indices [6]. In Ukraine the railway perishables transportation through the territory of Ukraine and inter-state communication is coordinated by the Ukrainian State Railway Refrigerated Transportation Centre "Ukrreftrans" which is a part of Ukrzaliznytsia and the Ministry of Infrastructure of Ukraine. It is association of four refrigerated wagon depots (Fastiv, Ternopil, Synelnykove and Kakhovka), founded with a purpose to create unitary coordinator in realization of economic and commercial activity during the perishables transportation. The Centre's depot has 116 refrigerated sections, 308 wagons-thermoses, the reequipped wagons to transport the perishables (type 918) which have warmed body, and refrigerated containers (model 1AAA-S-19) with loading of 29150 kg and platforms (model 13-470 and 13-9004) with carrying capacity of 60, 65 and 68 tons for transportation of large-capacity containers.

Since 2016 the following goods prevail in the structure of loads transported by the rolling stock of "Ukrreftrans": confectionery – 38,3%, beer – 27,6%, mineral drinks and waters – 9,0%, tinned food – 5%, meat and meat products – 3,3%, other food loads – 10,5%. "Ukrreftrans"

simultaneously executes the operator and forwarder functions, provides its own rolling stock for transportation of loads within Ukraine, CIS and Baltic countries, and also to such countries as: Turkey, Bulgaria, Romania, Slovakia, Poland and Hungary [7].

The list of regular users of services on transportation of the perishable foodstuffs by railway includes the following industrial giants: PJSC "Obolon", PJSC "Nord", LLC "Corporation "Ukrminvody", CJSC "AVK", confectionery corporation "Roshen", etc., the products of which are transported within Ukraine and abroad it, to the countries of Central Asia, Russia, Kazakhstan, etc. However, import from Poland, Hungary, Bulgaria, Mediterranean countries makes the basis of refrigerated transportation [8].

Also in November 2011 a structural subdivision of the State Railway Transport Administration of Ukraine – the State Enterprise "Ukrainian Transport and Logistics Centre" (SE "UTLC") began its work. Its main purpose is optimization of load transportations in Ukraine, centralized management of wagons of all state wagon companies, improvement of system of providing transport services, betterment of their quality, attraction of additional freight traffic.

From January to December 2016 the UTLC wagons transported almost 800 thousand tons of perishables. Among them almost 240 thousand tons were exported and about 75 thousand tons were imported in Ukraine [7]. Transport network of railway rolling stock has a number of advantages in the perishables transportation, but its main defect is inability to deliver a load directly to the retail consignees' enterprises. On the contrary, the automobile transport executes the perishables transportation to consignee regardless of a presence of access tracks at their enterprises just due to its mobility, but with higher expenses. That is why it is necessary for railway transport to interact with automobile one. In such case, the main part of transportation is made by railway transport and automobile transport execute carry and carry out of loads to/from railway stations, passing short distances. As a rule, such transportation by automobile transport is made within the same settlement or in intercity communication. Intercity transportation of loads includes

transportation made outside the city (other settlement) at a distance more than 50 km [2].

During intercity automobile transportation of loads the distances of transportation are determined in accordance with the guides approved by the road guides authorities (atlases of automobile roads). Hereby, they additionally add to the passage of cars (road trains) to each station of reception or handing of load at place of destination the following: 30 km for Kyiv; 20 km for such cities as: Dnipropetrovsk, Donetsk, Zaporizhia, KryvyiRih, Lviv, Luhansk, Odesa, Kharkiv; 10 km for other regional centres; 5 km for other cities and settlements. One of the main criteria which define the consignor's choice of kind of transport to transport the perishables is a distance of transportation. Cost of transportation, which is an important index for consignor, significantly differs depending on the distance of the perishables transportation or by automobile transport, or by railway rolling stock.

So, during transportation of large volumes of perishables (> 25 tones) for long distances (within the state or in international communication) it is much more profitable to use railway rolling stock, and during transportation of small volumes of perishables (25 tones) for short distances it is more profitable to use automobile one.

Therefore, there is a need to find optimal distances of transportation by each kind of transport for their effective interaction that will be a benefit for all participants of transportation process. The ATP determines four types of specialized transport equipment for the perishables transportation [9], such as: isothermal transport equipment, iceboxes, refrigerators and the heated transport equipment. Under the term "transport equipment" we mean wagons, trucks, trailers, semi-trailers, containers and other similar transport equipment. For liquid perishables they use tank-cars.

**Conclusions.** The main task of automobile and railway transport during the perishables transportation is to preserve the quantity, quality and shelf life of loads to be safe and healthy for population. In the article we researched the process of the perishables transportation by automobile and railway transport in



Ukraine. We analyzed the volumes of production and consumption of foodstuff by its main groups. We made the balance of production and consumption by main groups of perishable foodstuffs, on the basis of which it is possible to make an assumption on possibility to export and need to import some loads. Also we analyzed the main list of perishables transported by automobile transport and railway rolling stock, revealing discordances in conditions of transportation of some goods that requires its further research. We analyzed the expediency to use automobile and railway transport for the perishables transportation depending on the distance of transportation. We found out that railway transport is more preferable for long distances and automobile transport – for short distances. The prospects of our further research are: - to analyse the factors of influence on time of the perishables transportation in automobile and railway communication; - to research the technological process of the perishables transportation in automobile and railway communication; - to ground the distances at which it is advisable to transport loads in automobile and railway communication.

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