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Dispositions of the Population for Survival in Crisis Situations

Introduction

The Czech Republic, as well as the other advanced countries, lays considerable stress on preparing for the occurrence of emergencies or crisis situations. Relevant legal standards, whether of legal or subordinate legislation character are a mainstay, as well as the other documents accepted by e.g. the National Security Council or the Government of the Czech Republic in the form of resolutions.

The key outputs laid down in the regulation (1) include the types of plans, through which a relevant ministry or another administrative body establishes the types of procedures, principles and measures to cope with a specific type of a crisis situation identified in the Threat Analysis for the Czech Republic (2) as a hazard with an unacceptable risk, for which declaring a state of emergency can justifiably be assumed. The current types of plans, the number of which is 22, have been valid since January 1, 2018 and they significantly increase the level of response to the possible occurrence of certain crisis situations.

The Czech Republic was not able in the past, is not able on the present and will not be able in the future to guarantee all essentials of life for the population in the current standard we have got accustomed to during the last period of ten years in the event of really large-scale crisis situations. The established mechanisms of economic measures for the states of crises and state material reserves – see (3) and (4) may not be sufficient and in any case not inexhaustible; it is logical that even the international aid has its limits.

For instance, the Government of the Federal Republic of Germany is well aware of the similar situation. In the currently accepted “Konzeption Zivile Verteidigung” (5), it calls the population to maintain water reserves for 5 days and food reserves for 10 days to support state measures through a proper people´s own security - “*Schließlich soll der Selbstschutz der Bevölkerung durch geeignete staatliche Maßnahmen gestärkt werden. Die Bevölkerung wird angehalten, einen individuellen Vorrat an Lebensmitteln für einen Zeitraum von zehn Tagen vorzuhalten, um durch entsprechende Eigenvorsorge die staatlichen Maßnahmen zu unterstützen“* (5). It is then possible to take up with the given issue in the published booklet entitled Katastrophen - Ratgeber für Notfallvorsorge and Handtich in Notsituationen (6). Another related published material – Meine persönliche Checkliste – Ratgeber für Notfallvorsorge und richtiges Handeln in Notsituationen (7) then recommends and calculates the stockpiling of drinking water and food for up to 14 days.

The Czech Republic has not issued any of such recommendations in any of the legal norms or other documents relating to the issue of the occurrence and response to possible crisis situations or the protection of the population at all. However, despite the absence of this recommendation, it is possible to express a research hypothesis on at least the partial preparedness and dispositions (preconditions) of the population of the Czech Republic to cope with the large-scale crisis situations.

Based on the realized survey, this contribution seeks to answer what is happening in this area.

The servey and the sample

The servey into the preparedness of the population for crisis situations has been implemented through a detailed questionnaire survey. The questionnaire has contained 57 closed-ended and open-ended questions. Altogether, 100 questionnaires have been distributed, 90 questionnaires have been evaluated (a part of the questionnaires have not been returned, another part of them have been excluded from the evaluation due to some shortcomings). The research was carried out in the course of one month - the second quarter of 2018. The basis was formed by a selected sample of students in the field of Population Protection at the Faculty of Logistics and Crisis Management of TBU in Zlín; the students also helped evaluate the questionnaire survey.

The selected sample of respondents can be defined as follows: The strongest representation was in the age category of 15-25 years (56 %) and 26-64 years (34 %). The respondents who are residents of a town (town - over 3,000 inhabitants) - a total of 57 % of the respondents predominate, a total of 43 % of the respondents were from villages. The prevailing educational attainment (also with respect to the age structure of the respondents) is secondary (69 %) and university (17 %). The prevailing number of household members is 4 in 30 % of the respondents. The two-member households (26 %) and three-member households (21 %) are another large group.

A total of 45 % of the respondents have been participants in an emergency or a crisis situation associated with a threat to running the household; a total of 76 % of the respondents have experienced a flood (mostly four-member households) and a total of 42 % have experienced a fire. The respondents have taken part in an exercise that simulated the occurrence of an emergency - a total of 53 % of the respondents at primary or secondary schools, a total of 17 % of the respondents in a municipality where they live and a total of 9 % of the respondents at work.

Only 27 % of the respondents participated in rescue, clearance and renovation operations as volunteers in the occurrence of emergencies or crisis situations; the majority of the respondents came from municipalities with fewer than 3,000 inhabitants.

Approximately 81 % of the respondents believe that an emergency or a crisis situation may occur that could threaten them, and 80 % of the respondents believe that it is advisable to have a minimal stocks of food at home in the event of a crisis.

The evaluation of the results of the questionnaire survey is given below.

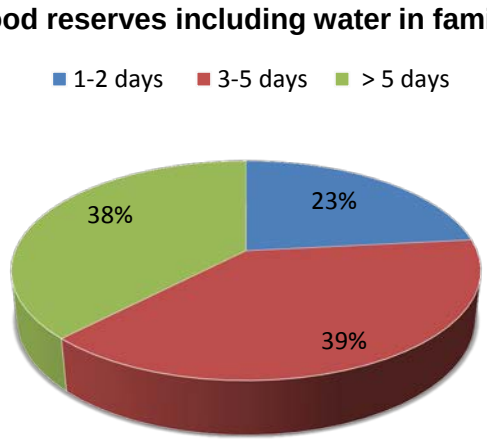
Results and discussion

The research has been aimed at the level of household selected sample of students food stocks (the concept of food also includes liquids, in this case, water) for the selected sample of respondents in the event of the occurrence of an emergency or a crisis situation. The overwhelming majority of the respondents (80 %) believe that stocks are necessary; however, the stock level differs significantly not only between the town and village residents, but also in view of the number of household members. It is also possible to use the stocks in the event of infrastructure malfunction (whether its part or the whole). The summary results are given below.

Probable food reserves in families to be used in emergencies or crisis situations

Approximately 34 % of the respondents believe that they have the stocks of food and water for more than 5 days, 35 % of the respondents for 3-5 days and 21 % of the respondents for 1-2 days. A total of 10% of the respondents did not answer the question.

Chart 1 Amount of food stocks including water in days according to (8) in respondents



Food stocks

With respect to food stocks, the respondents have been asked gradually within the basic food groups. Stocks of chilled and frozen meat in their households appear to be sufficient both in terms of quantity and in terms of the representation of individual types of meat. Chilled meat stocks prevail in the respondents from the town; on the contrary, frozen meat stocks prevail in the respondents from the village. The stocks of pork, chicken and beef are the largest. The stocks of main types of meat in kilos are shown in Table 1. The quantity of chilled smoked foods in households ranges from 0.2 to 0.5 kg. None of the addressed respondents freeze smoked foods, i.e. there are no frozen smoked foods.

The stocks of fats are most often 0.5 kg (i.e. 2 pieces of butter or 2 pieces of margarine) and 1 kg (4 pieces of butter and 4 pieces of margarine). In terms of the stocks, the respondents from the village are better prepared.

The stocks of milk are most often 10 litres (a total of 22 % of the respondents), a total of 50 % of the respondents have less than 10 litres; the remaining respondents

have more than 12 litres of milk (28 % of the respondents). As for dairy products, the answers are similar to those of butter and margarines, the respondents most often have stocks between 0.5-1.0 kg.

Purchased potatoes, fruit and vegetables are another commodity valued. Most respondents have the stocks within the range of 5-7 kg. Current stocks of purchased fruit and vegetables range from 0.1 to 1.5 kg. The differences between households of respondents in the towns and villages are irrelevant.

As regards the stocks of sugar, flour and rice, the stocks of sugar can be most often derived within the quantity of 3 kg, rice in the quantity of 2 kg and flour in the quantity of 5 kg. The stocks of fresh pastry and frozen pastry are most often in the quantity of 1 kg. The egg stocks are most often within the quantity of 10-30 pieces. The stocks of pasta are most often within the quantity of 0.5-1.5 kg, pulses within the quantity of 0.5 kg; the respondents of villages have more stocks. The stocks of canned food and dehydrated meals are not significant; these are most often up to 5 pcs of dehydrated meals.

The amount of chocolate and confectionery in households is most often very different, the values range from 0.5 to 1.5 kg.

Another question related to the amount of bottled drinking water in households of respondents. The values are again very different, ranging from 1 litre to 66 litres. Households of respondents most often have the stocks between 6 and 20 litres.

Table 1 Stocks of the main types of meat in kg (frozen and chilled)

Amount of meat [kg]	**Type of meat (frequency of answers)**			
	Frozen meat			
	Poultry (chicken) [%]	Pork [%]	Beef [%]	Fish [%]
0	10	11	24	31
1-3	51	42	35	62
4-5	27	22	29	7
6-10	5	11	6	0
>10	7	14	6	0
	Chilled meat			
0	69	62	84	82
< 1	19	25	11	18
1-3	11	10	5	0
4-5	1	3	0	0

Animal breeding

Only 22 % of the respondents have answered the question related to animal breeding; they have said they breed animals that they could prepare for consumption in the event of food supply interruptions (mainly hens, chickens, ducks, turkeys, rabbits, sheep and pigs). The number of animals increases with the onset of spring months; on the contrary, it decreases with the onset of autumn months (applies to almost all animals except hens).

Fruit and vegetable growing

With regard to fruit and vegetable stocks, a total of 52% of the respondents have replied that they grow fruit and vegetables; the growers in the village prevail. The respondents have been asked about the possibility of self-supply of fruit and vegetables. The results have been very varied both in terms of kinds and in terms of the grown quantities. Nevertheless, the most frequently represented commodity is potatoes (village as well as town), further apples and carrots. The most frequently grown quantity ranges from 10 to 15 kg per a household of respondents. Here, the usability of the grown fruit and vegetables is limited mainly by the season – naturally, the amount of stocks is not constant throughout the year.

Utilization of drinking water sources

From the viewpoint of the utilization of a water source, 81 % of the respondents indicate the town or municipal water main as the drinking water source, 19 % of the respondents use municipal wells. As to the backup water sources, 61 % of the respondents have answered that they have no possibility to use a backup water source. A total of 33 % the respondents report the possibility of using their own wells and a total of 6 % of the respondents report the possibility of using a municipal well.

Access to non-drinking water

Another question has related to the access to non-drinking water. A total of 63 % of the respondents do not have any access. Of 37 % of the respondents who have an access to non-drinking water, a total of 27 % of the respondents report possible stocks for 10 days, 11 % of the respondents for 10-14 days and 11 % of the respondents for 30-60 days. The differences between the respondents´ answers from the town and the village are not significant.

Electric energy sources

Further, a total of 98 % of the respondents mention the use of electric energy from a public source, 3 % of which also use solar energy and 4 % are given the option to use a genset or a power plant. There are no significant differences between the town and the village and there are no significant differences in the number of households of respondents. The duration of the functionality of the backup power sources is 2 to 3 days according to the respondents, only one respondent indicates 10 days (given by the average fuel supplies for these sources).

Standby sources of food preparation

From the viewpoint of the source for the heating up of dishes, a total of 39 % of the respondents use a gas stove connected to a gas pipeline, 41 % of the respondents use an electric stove, 7 % of the respondents use a gas stove connected to a gas bottle, and 13 % of the respondents use a combined stove. A total of 46 % of the respondents have a backup source for the heating up of dishes and a total of 54 % have said they do not have a backup source. The respondents have most often reported the usability of backup sources for the heating up of dishes in the length of 2-7 days, some of them have reported up to 11 days.

Standby supply of fuel

Other questions have been directed to the possibilities of emergency fuel. As for the fundamental source of fuel, a total of 90 respondents have answered as follows: a total of 40 % of the respondents use gas, 20 % of the respondents use solid fuels and 19 % of the respondents use electricity; these are the most frequent answers (remaining 21 % of the respondents use another type of fuel or a combination of different types of fuel). The respondents from the town most often burn gas and use electricity for heating, followed by solid fuels. In the village, the ratio of heating by electricity, solid fuel burning and gas burning is equal. From the viewpoint of backup sources, 67 % of the respondents mention the possibility of their use. Nevertheless, when asked about how many days this standby source of fuel will hold out, a total of 78 % of the respondents say they have no stocks for a backup source. Only 12 % of the respondents indicate the stocks for one year and 10 % of the respondents for half a year. The village residents are better prepared.

Hygienic and other necessities

The conclusion of the questionnaire has been aimed at the stocks of hygienic necessities and plastic dishes of respondents. Households of respondents have soaps in the quantity of 1-30 pcs, but most of them have 5 pcs as a reserve; the village residents have larger stocks. The largest quantity of shower gels in their households corresponds to 3 litres (the range of responses from 0.5 to 8 litres). The stocks of toilet paper in these households are most often between 5 and 9 pcs in the town residents and 10 to 35 pcs in the village residents. The next question has been directed to the stocks of detergents; households of interviewed most often have up to 3 litres of them. As for disinfectants, a total of 32 % of the respondents have reported the stocks of 0.5 litres, 34 % have reported the stocks in the range of 1.0-1.2 litres and 32 % then 0-0.05 litres. Only 23 % of households have plastic utensils.

Conclusion and proposals for practice

A. As concerns the food stocks, it can be said that the households of respondents has food stocks for several days, which is very positive.

   Nevertheless, a significant part of their households do not have the following:

   - standby power supply that would be able to keep the stocks in refrigerators or freezers when the electricity supply is interrupted;
   - standby sources for the heating up of dishes.

Most of the food cannot be kept without a refrigerator or a freezer (only 1 % of the respondents say they have a cellar where the temperature is not higher than 7°C also in summer months, which is the ideal temperature for chilled food); most of the food is inedible without heating up. Then, the possibilities of healthy eating for most of these households can be significantly complicated in the event of emergencies or crisis situations associated with the constraints of supplying (interruption of food supply) or the constraints of energy. Here, homeowners can be advised to aim at the stocks of canned or dehydrated ready-to-eat meals, where the need for storing in the cold or freezing is avoided, and even the heating up of canned foods.

Some respondents have admitted that part of the food stocks (although very small) is after the date of minimum durability. However, the food stored after the date of minimum durability does not necessarily imply the emergence of health problems after consumption (e.g. in case of dairy products). In case of meat and perishable meat products the consumption should be taken into account.

Some food, even if it does not need the heating up and is in the canned form, is not suitable for a long-term consumption (or for the consumption in large quantities). These include e.g. jam, preserved fruit, sterilized vegetables, etc.

B. A basic standby source of food preparation is a problem for more than half of households of mentioned respondents. This greatly reduces the usability of food stocks in these households when energy supplies are interrupted.

C. In the winter season, the impossibility to use standard sources of fuel can be a major problem for a third of these households.

D. Households of respondents have the stocks of hygienic necessities to a certain extent. The stocks of soap appear to be sufficient to cover even a few tens of days; toilet paper can be replaced by another suitable means. However, especially the stocks of plastic dishes can provide, among other things, comfort and also certain hygienic conditions when eating, in the event of interruption or limitation of supply whether drinking or at least access to non-drinking water, it will not be possible to ensure proper washing and reuse of ordinary kitchen utensils - especially for eating.

E. None of the respondents has said he/she belongs to “preppers” (persons or groups actively preparing for emergencies including possible disruption of social and political arrangements, etc.).

On the basis of the above mentioned points, it is clear that in the worst-case scenario - the interruption of food and energy supplies to households in the event of emergencies or crisis situations, the usability of food stocks in households of respondents is limited in a certain way for their catering. The possibility of using standby sources for the preparation of food and household heating is also (and in this case considerably) limited.

The German concept of the population protection (5) and the materials published include the recommended amount of stocks in the event of a crisis. It is a recommendation for one adult for 14 days in an energy value of 9,204 kJ (see Table 2).

Table 2 Recommended amount of stocks in the event of a crisis situation

SN (sequence number)	Type	Unit	Recommended amount per one person/10 days
1.	Beverages	l	20,000
2.	Cereals, cereal products, bread, potatoes, noodles, rice	kg	3,500
3.	Vegetables, pulses (including canned pulses)	kg	4,000
4.	Fruit and nuts (including preserved fruits)	kg	2,500
5.	Milk and dairy products	kg	2,600
6.	Fish, eggs (powdered eggs)	kg	1,500
7.	Fats and oils	kg	0,357
8.	Sugar, sweetener, honey, jam, chocolate, iodized salt, ready-made meals (e.g. ravioli, dried tortellini, instant soup), dehydrated potato products, etc. – at your discretion	-	-

Source of the table (7) with a formal modification made by the authors

It is also recommenced to have sugar, honey, chocolate, iodized salt, ready-to-eat food, dehydrated potato products, flour, dehydrated foods, cocoa and biscuits in the household (without determining a specific quantity).

However, according to the recommended food composition, it is assumed that it will be possible to heat them up (i.e. households will have a source of energy or the possibility of using a standby energy source.

Within the framework of professional standards, it is also possible to search out a recommended dietary allowance per person and day and its energy and nutritional values in the Czech Republic, as well as the energy values of selected foodstuffs; however, it is not a recommendation for the supplying of households; it serves as a basis for ensuring sufficient amount of food in the implementation of the measures for the emergency survival of the population in the competence of the Fire Rescue Service of the Czech Republic (9). In addition, there is a proposal for dietary allowances for crisis states in a variant with the possibility of using the refrigeration technology as well as in a variant without using the given technology. The given dietary allowances could be a starting point for determining recommended necessary stocks for the population in the event of emergencies or crisis situations; they are designed to meet the energy and nutritional value of food for the population (the allowances are applied in the case of an increased physical strain in women and men – e.g. the assistance in dealing with the consequences of a crisis situation) (10).

Table 3 The energy and nutritional values of dietary allowances for the civilian population

Energy and nutrition indicator	Unit	Dietary allowance for the population	Allowance B	Allowance C	Allowance D
Energy value	kJ	9 000.0	2 000.0	1 000.0	5 560.0
Animal proteins	g	35.0	5.0	5.0	27.0
Plant proteins	g	35.0	5.0	0.0	20.0
Proteins total	g	70.0	10.0	5.0	47.0
Fats	g	65.0	10.0	10.0	61.0

Source of the table (10) with a formal modification made by the authors

The authors of this paper believe that this is a very important area that should be conceptually handled and further elaborated in a certain, at least minimal way within the Czech Republic for a long time to come. They will welcome any further cooperation with experts on the given topic.

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R E S U M É

Příspěvek se zaobírá dispozicemi vybraného vzorku obyvatelstva pro přežití při vzniku krizových situací. Hodnotí jeho schopnost vyrovnat se s přerušením dodávek potravin, pitné vody a energií. Odpovídá např. na otázky: „Jaké aktuální zásoby potravin a pitné vody obyvatelstvo ve svých domácnostech má nebo jakými náhradními zdroji energií obyvatelstvo disponuje pro přípravu stravy?“

Klíčová slova: Dispozice, energie, krizová situace, náhradní zdroje, otop, pitná voda, potraviny.

S U M M A R Y

This paper deals with the dispositions of the selected sample of the population to survive the crisis situations. It evaluates its ability to cope with interruptions in food supplies, drinking water and energy. It answers, for example, the questions: "What current food and drinking water stocks does the population have in their households or what alternative energy sources does the population have for preparing food?"

Keywords: Crisis situation, disposition, energy, drinking water, food, spare resources, sources of fuel.