

## **DETERMINANTS OF SATISFACTION OF RUNNING EVENTS' PARTICIPANTS. ANALYSIS OF THE MARKET OF SPORT SUPPLEMENTS AND NUTRIENTS FOR ATHLETES**

### **Introduction**

In North America and Western Europe numerous mass running events have been dynamically developing for many years. Relevant data amount to an incentive to analyze the phenomenon, as there can be observed annual growths of the number of events and participants reaching several dozen percent. Statistics confirm the adequacy of observing Central Europe and suggest a similar growth scenario for this part of the world. The emotional character of runs is developing along with the awareness of the need to treat them as a product, an undertaking which must be regulated and entails organizational, business and other objectives. Hence, the approach within which the quality of service quality and, consequently, satisfaction measurement are considered, appears to be valid. The participant satisfaction is influenced, apart from motivation and results, by other highly diversified factors. In this regard the diet and supplements are significant as they are applied in order to enhance the runner's capacity, well-being, comfort during their participation in the run as well as to systematically improve achieved results.

In the present article the success factors in relation to a running event have been presented. The factors are identical with quality criteria. They have been defined as a result of preparatory research conducted in Poland. Particular emphasis has been put on the market of diet supplements – one of frequently neglected factors by amateur runners who do not treat it as an element influencing physical capacity and achieved results. These products are often used by participants of marathons, halfmarathons etc. It can be observed during the analysis of mature markets (in relation to running events) in the area of supplements. Central and Eastern European markets have also been analyzed, in particular Polish and Ukrainian markets. The analysis in this regard have embraced a review of main market players and their products as well as the characteristics of the functionality of model needs for nutrients during and after physical effort. The paper depicts development perspectives for supplement and nutrient markets.

## 1. Attitude towards measuring clients' (running events' participants) satisfaction

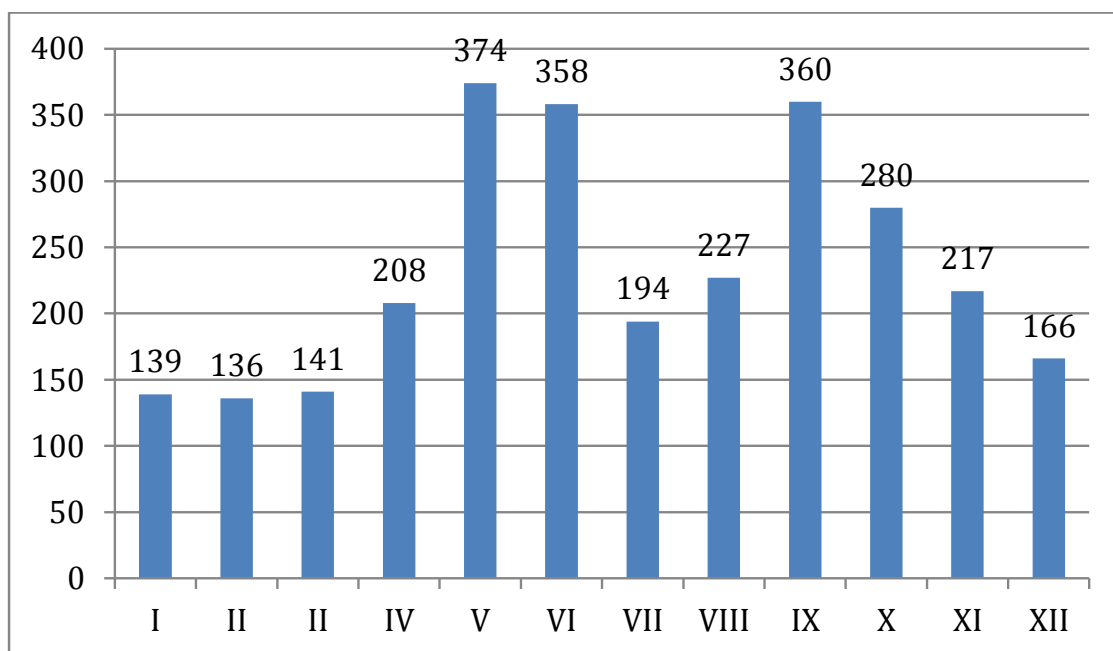
Big running events mostly take place in the biggest cities in the world, overwhelmingly in developed countries. Moreover, this trend begins to reach also the Central and Eastern Europe.

Table 1. Number of participants of 50 biggest marathons in Europe

Name of the run	Country	2013		2012		2011	
		Number of participants	Position	Number of participants	Position	Number of participants	Position
Maraton de Paris	FRA	38 690	1	32 980	3	30 648	3
Berlin– Marathon	GER	36 474	2	34 377	2	32 816	3
Virgin London Marathon	GBR	34 312	3	36 699	1	34 805	1
Stockholm Marathon	SWE	15 653	4	14 676	5	15 465	4
Maratona de Barcelona	ESP	14 778	5	16 013	4	12 469	6
Dublin Marathon	IRE	12 346	6	12 201	7	11 682	8
Marathon Hamburg	GER	11 450	7	10 319	9	11 188	9
Amsterdam Marathon	NLD	11 307	8	10 144	10	9 637	11
Frankfurt Marathon	GER	11 011	9	11 948	8	12 428	7
Maratona di Roma	ITA	10 665	10	12 677	6	12 614	5
Madrid Marathon	ESP	10 462	11	9 959	11	8 001	13
Copenhagen Marathon	DMK	9 177	12	9 506	12	9 214	12
Brighton Marathon	GBR	9 110	13	8 910	13	7 826	14

Source: Z. Waśkowski, Marketing imprez biegowych, Bogucki Wydawnictwo Naukowe, Poznań 2014, s. 15

Figure 1. Number of running events in Poland in 2013 according to months



Source: Z. Waśkowski, Marketing imprez biegowych, Bogucki Wydawnictwo Naukowe, Poznań 2014, s. 43

By observing the market in Poland and many other countries we may take notice of an extremely dynamic growth of the number of participants. The reasons for this phenomenon are among others: a more significant, in comparison with the past, tendency among Poles to pursue a healthy and active lifestyle, popularity of running in western countries, and the growing availability of high quality footwear, clothes and accessories for runner, and the growing number of sizable running events, and relatively low costs of training, and the lack of strictly established requirements related to arenas. In the last several years the number of running events in Poland has increased every year even by 20–25% [Waśkowski 2014].

Table 2. Number of Participants in the Biggest Runs over 10km in Poland

Name of the run	2011		2012		2013	
	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year
Biegnij Warszawo	8479	20,59%	9773	15,26%	11710	19,82%
Bieg Niepodległości (Warszawa)	6135	6,58%	7209	17,51%	10157	40,89%
Orlen Warsaw Marathon	-	-	-	-	7735*	-

Bieg Niepodległości (Gdynia)	1858	43,36%	2885	55,27%	5594	93,90%
Nocny Bieg Świętojański	1077	31,18%	1950	81,06%	4363	123,74%
Bieg Powstania Warszawskiego	2196	4,67%	2785	26,82%	4055	45,60%
Bieg Europejski	661	1,23%	1589	140,39%	3184	100,38%
Bieg Westerplatte	1175	71,28%	940	-20,00%	2817	199,68%
Mariacka Dziesiątka	1433	10,57%	1936	35,10%	2284	17,98%
Bieg Urodzinowy	200	-47,92%	1485	642,50%	2240	50,84%
Razem:	8600	X	13570	X	54139	X

\*Orlen Warsaw Marathon in 2013 was held for the first time.

Source: Polish Association of Running.

Table 3. Number of Participants in the Biggest Halfmarathons in Poland

Name of the run	2011		2012		2013	
	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year
Półmaraton Warszawski	4700	33,22%	7174	53,64%	10074	40,42%
Półmaraton Poznań	3517	42,33%	4409	25,36%	5743	30,26%
Półmaraton Ślązański	1200	24,22%	2953	146,08%	2659	-9,96%
Półmaraton Słowaka	1699	89,41%	2060	21,25%	2035	-1,21%
Półmaraton Philips Piła	2114	22,84%	1933	-8,56%	2431	25,76%
Półmaraton Jurajski	1398	13,47%	1585	13,38%	1420	-10,41%
Półmaraton Marzanny	513	10,80%	1175	129,04%	1702	44,85%
Półmaraton Kościański	914	26,42%	1099	16,79%	1321	20,20%
Półmaraton Gryfa	754	34,64%	831	10,21%	1291	55,35%
Półmaraton Bytomski	832	116,17%	907	9,01%	1198	32,08%
Razem	17461	X	24126	X	29874	X

Source: Polish Association of Running.

Table 4. Number of Participants in the Biggest Marathons in Poland

Name of the run	2011		2012		2013	
	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year	Number of participants	Change in comparison with the previous year
Maraton Warszawski	4061	22,25%	6797	67,37%	8506	25,14%
Maraton Poznań	4629	19,52%	5426	17,22%	5678	4,64%
Maraton Wrocław	2773	37,47%	3900	40,64%	3501	-10,23%
Maraton Kraków	3201	32,44%	3014	-5,84%	4415	46,48%
Maraton Dębno	806	-17,42%	1091	35,36%	1340	22,82%
Maraton Łódź	494	-	1011	104,66%	1016	0,49%
Maraton Katowice	695	26,36%	729	4,89%	829	13,72%
Maraton Gdańsk	587	26,24%	630	7,33%	739	17,30%
Koral Maraton	439	44,41%	485	10,48%	514	5,98%
Maraton Toruński	585	12,93%	450	-23,08%	663	47,33%
Razem	18270	X	23533	X	27201	X

Source: Polish Association of Running.

List of cities in Ukraine (Ukraine), which organizes the marathon: Kyiv, Bila Tserkva, Pereyaslav-Khmelnytsky, Odesa, Kharkiv. Preparing for International marathon start in Kyiv began in 2009. The first Kyiv marathon took place on the 16<sup>th</sup> of October, 2010. At that time there were 546 participants from 13 countries on the first run, among them 144 runners participated in a 42.195 m classical marathon. In 2011 the second Kyiv marathon gathered more than 1000 participants from 33 countries, 315 sportsmen covered the marathon distance. 1336 participants from 28 countries participated in the third Kyiv marathon which was held on the 6<sup>th</sup> of May, 2012, 250 sportsmen went on the marathon distance. 1693 participants from 33 countries took part in the fourth Kyiv marathon in 2013. 451 sportsmen went out to cover a marathon distance.

Since 2014 marathon route Kyiv first certified. Certification marathon route Kyiv 2014 provides the opportunity to formally assign ranks and rank athletes according to the results obtained on these routes. Now, all participants will be able to fulfill the standards of 3 youth to master of sports of international class.

The measurement of clients' satisfaction is inextricably connected to the standard of services. Therefore, it is necessary to take notice of the quality of a service – in this case organization of a running event – and to define its clients. It may be seen as an oversimplification to assume that participants' satisfaction

evaluation is one of the objectives, however, in a broader perspective we may include sponsors, VIPs, invited guests, family of participants and viewers in the group of clients or stakeholders. Defining these problems is related to establishing the research objectives, as we do not conduct the research for its own sake. In all cases the objective amounts to the basis for shaping a running event's quality.

The organizer, in order to meet clients' expectations, at the initial stage of preparation is obliged to identify potential recipients (possibly buyers, users and beneficiaries). At the next stage, it is necessary to define the recipients' needs and requirements. The gathered data is utilized in order to create a product (service) for the fully knowledgeable client. With the view to verify if the actions undertaken are effective, the clients' satisfaction measurement ought to be conducted. The course of the present considerations as well as the actions taken may be understood as a part of comprehensive philosophy related to quality management and process approach. Furthermore, Deming cycle, the icon of TQM, is definitely worth a proper consideration, as it encourages a system approach to organizing running events – in a broader perspective: consecutive editions.

Planning entails development of a running event's conception with its full specification. Accomplishment is the realization in accordance with the initial assumptions, which is followed by verification of its compliance with the model as well as by a proper analysis, in particular of the weakest elements. Moreover, it is significant to plan the next edition of the run. It is also important, at each of the aforementioned stages, to put emphasis on the client.

In general terms an external client is a person who is influenced by a product (service) created by an organization. An external client is not a member of the organization responsible for providing services (manufacturing the product). It also must be indicated that it is necessary to satisfy external clients, i.e. organizers and volunteers, possibly long with contractors (time measurement, photographic services).

An internal client, on the other hand, is an employee or organizational cell participating in the process of providing given services. An internal client takes over the effect of the work done by a different organizational cell and enriches the product (or a service) in order to hand it over to the next client. These actions lead to creation of a value chain at the end of which the recipient is located. Thus, an internal client is simultaneously a supplier for another internal client.

The questions related to research in measuring satisfaction of both clients' and employees' (internal clients) have been of interest of theoreticians and practitioners for many years. The role of a client's satisfaction is strongly

Małgorzata Miśniakiewicz, Sergii Kasian, Jacek Łuczak emphasized by ISO 9000 standards, TQM philosophy, Six Sigma and the criteria of the European Quality Award as well as its American equivalent – The Malcolm Baldrige National Quality Award. As far as profit-oriented enterprises are concerned, the role of clients' satisfaction is obvious; however, in the public sector (or other non-profit enterprises) clients' satisfaction ought to be a value itself and amount to the main objective of the organization. It is obvious that research in clients' satisfaction should serve as a way of constant self-improvement of the organization (as a means to achieve the assumed objectives) [Kozielski 2011]. Increasing the quality of services by improving various areas frequently does not bring expected results. It is so, because enterprises often are not able to identify factors which are significant for clients. The modification of the factors entails the increase in their satisfaction. The dilemma is linked with the running events frequently organized by administrative units, sometimes by commercial organizations in cooperation with administrative structures. It is of no importance who organizes the event, as we deal with a product on the market. It amounts to a serious problem for the administration, because of the specificity of its functioning as well as due to insufficient preparation for providing commercial services. On the other hand, we should remember that, in contrast with the dominating private sector, public sector institutions do not have the comfort to choose or focus on their "favorite" clients (treating them as the target group), both of which bring the most sizable profits. Public administration must take proper care of the whole society, which causes its readiness for providing services for undiversified clients not divided into the better and worse ones.

The public sector is now under significant pressure to meet increasing standards of the private sector. In reference to public administration the information from clients ought to amount to the starting point of defining the directions of improving the services provided.

Research in clients' satisfaction should lead to gaining customers' trust as well as it ought to introduce new adequate solutions taking into account clients' needs and expectations. Consequently, it will result in shaping and improving the administration's image. The research itself appears to be extremely difficult, though. The most significant roadblock is the fact that satisfaction is not a static phenomenon, but evolves in time. Furthermore, satisfaction is frequently the result of both clients' experiences and subjective impressions before, during and after the satisfaction is measured [Kancelaria Prezesa Rady Ministrów 2008]. The research problem in this aspect must be focused not only on the results, but, which is more important, on understanding the quality of the service provided by the organizer, comprehending the

differences between people observing the quality as well as it must concentrate on the adequacy of research methodologies.

## **2. Selected succes factors of running events**

On the basis of professional literature and experience, the first set of criteria related to running event participants' satisfaction was developed. The criteria were verified especially in order to eliminate the ones that are inadequate in reference to the analyzed event.

There has been appointed a 10-person team comprising representatives of organizers, participants and researchers dealing with the problem of quality management in sports. The aim of the undertaking is to identify the characteristics of the event and a runner's participation, which at further stages of the research will be assessed in order to grant them the importance status.

Participant satisfaction factors were divided into following categories: organization of the run, infrastructure, costs of participation, achieved results, packages and medals, self-organization of runners, communication, others.

In the frames of a given category there was a multisession identification of satisfaction factors conducted with the use of Ishikawa diagram:

- organization of the run: accessibility of information, beverages, catering in the finish area, track marking, accessibility of volunteers, deposit, toilet accessibility, organization of the start area, organization of the finish area, time measurement, photographic/video services, possibility of finishing the run with a child, attractiveness of the course, number of participants hindering the run, available beverages and available energy food on the course, information about the completed distance, information about the time,
- infrastructure: assuring protection from unfavorable weather conditions, possibility of taking a shower, a parking lot,
- participation costs: admission, traveling costs, costs related to the necessary outfit, accommodation costs before and/or after the run,
- achieved results: achieving desired results, beating one's personal best, overcoming other participants,
- packages and medals: a start package, the price of the package, a rich package, a rich package/reasonable admission, a bib, a medal, designing the medal,
- self-organization of the runner: support from measurement devices (e.g. a watch, a heart rate monitor, a pedometer, GPS), mood and attitude (independent of the run), listening to music during the run,



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adequacy of outfit for the weather conditions, using mobile applications during the run, using energy gels, using isotonic beverages, diet prior to the run,

- information: accessibility of the information about the run on the Internet website, information about the completed distance during the run, information about the time during the run, information about the time at the finish line, contact with the organizer,
- others: satisfaction from the preparation of the run, conscientious realization of the training plan, presence of relatives, favorable weather, festive atmosphere, big number of participants, popularity of the run.

Selection and evaluation of adequacy of factors related to the quality of the running event and participant satisfaction amounted to a basis for creating a questionnaire and conducting a research which aims at the detailed evaluation of the given phenomenon. However, the future research will be related to participants in long-distance runs – marathons and triathlons – and will have the international dimension.

All of the members of the research team show diet and sport food as important factor for assuring satisfaction of runners.

Unfortunately, as show the available analysis of the diet of the majority of the amateur runners, their everyday practice is not as optimistic as the declarations. The dietary habits of the average runner leave a lot to be desired. Food supplements for athletes seem to be a solution of this problem in some scope, especially in their opinion. That is why they are more and more popular not only in West Europe countries but in South-East Europe ones as well.

### **3. Dietary and nutritional supplements for athletes as a product category**

Due to a growing global awareness of the importance of exercise to overall health coupled with the increasing acceptance of the nutraceutical market, consumer demand for supplements geared towards sports nutrition continues to increase.

Nowadays, the use of supplementation is an essential part of the diet of any person seriously engaged in a particular sport. During intense exercise, which is a training, the body loses with sweat large amounts of water and minerals. Taking supplements and isotonic drinks before, during, and especially after exercise is therefore to supplement the deficit of water, as well as necessary for the proper functioning of the body of nutrients and minerals,

which contributes to faster recovery of the body and increase its efficiency. However supplements use by athletes present many challenges to health care professionals. There need to be respected the athlete's desire to optimize performance and balance this with the need to protect the athlete's health. Supplements are available so readily and hold significant appeal because of the promise of quick results with little effort [Bean 2005; Bonci 2009].

Most athletes, especially amateur ones, consider supplements an important and often a magical factor helping them to achieve success in sport. Scientists, on the other hand, are sceptical about them – they do not think that supplements enhance physical efficiency and emphasize that physical efficiency depends on many factors, among them talent, training, sport equipment, diet and the mental predisposition of each athlete.

Depending on the sport discipline, individual predisposition of the body, or physical exercise phase the demand for the different formulations may be different. Access to the reliable information on this topic should allow a well-informed choice and their intended use.

Since an athlete's health is always most important, only supplements, which are safe, effective and permitted in sport should be used [Celejowa 2008; Delavier, Gundill 2010].

**The most popular categories of supplements for athletes include:**

- Amino acids,
- Nitrogen Boosters,
- Glutamine,
- HMB,
- Creatine,
- Preparations for protection of the joints and bones,
- Dietary Protein,
- Dietary carbohydrate,
- Energy preparations,
- Reducers, fat burners,
- Growth hormone stimulators,
- Testosterone stimulators,
- Vitamins and minerals,
- Special Products,
- Bars,
- Drinks.

Considering the possibility of usage of dietary supplements we should recognize preparations intended for:

- mass building,
- strength building,
- preparations aimed at women,
- health and beauty,
- improve energy,
- increase concentration,
- increase libido,
- regeneration,
- fat burning.

Sport supplements taking into account the advantages of the selected group of nutrients can be divided into:

- Protein nutrients,
- Carbohydrate and protein ("Weight gainer"),
- Carb ("Carbo") nutrients.

#### **4. Food Supplements for athletes – market analysis**

According to BCC Research, the global market for sports nutrition products had a compound annual growth rate of 24.1%, and reached \$91.18 billion in 2013. Many supplement manufacturers have expanded offerings for distributors based on increased sales within this segment.

Forecasts of the Foreign Markets Research Institute show that the global market for nutritional and sports supplements in the coming years will show steady growth. The value of international turnover of these products in 2015 is projected to reach 125 billion USD. The largest segment of the market remain energy drinks for athletes, but the category of nutritional and dietary supplements is showing dynamic growth. The main markets for the product categories will be the United States and Japan, although the dynamic sales growth will come from China, India and Latin America. In the latter countries, the cumulative annual growth rate of sales for 2015 will reach more than 7 percent. A phenomenon in this regard are the markets of Central and Eastern Europe, where interest in active lifestyle and dietary supplementation during training and immediately after them is growing dynamically and will grow in the coming years.

While in Poland the interest in nutrients is visible only from 2–3 years, but it is growing very rapidly, annually within 20–30%. According to estimates,

the sports part of the market is 1 billion zł [Rynek suplementów...2014]. It is worth noting that Polish producers compete on equal terms with Western producers, not only on price but also quality basis. For example Polish manufacturer of nutritional Activlab exports its products to the European Union and the Middle East and opened its branch in the United States.

The largest companies operating in the international market supplements and sports supplements are: Abbott Nutrition, Red Bull, Slim-Fast Foods, Dymatize Enterprises, AST Sports Science and Body Wise International [Światowy rynek odżywek... 2014]. Major participants of the market of nutrients and supplements for athletes in Poland are:

1. **Olimp** – produces nutrients and sport supplements enhancing physical fitness and correct post-workout recovery, a leader of this industry in Poland. Its production is based on the highest quality, proven and tested raw materials sourced from around the world. As one of the few companies in the world produce nutritional supplements for athletes under pharmaceutical GMP having implemented and certified in the practice the quality management systems ISO 9001: 2008 and ISO 22000: 2005 (including the principles of HACCP). Main brands of Olimp company:
  - **OLIMP SPORT NUTRITION®** – more than Supplements – nutrients and supplements for sportsmen
  - **ENDURANCE SPORT™ – THE SECRET OF CHAMPIONS™** – first professional line of products dedicated endurance athletes.
  - **OLIMP-Laboratories** – brand of pan-European presence in the markets of Germany, Austria, Switzerland, France, and Scandinavia – includes products targeted to both the people who care about the overall health condition, as well as those who want to enrich their diet with vitamins and macro and micronutrients in particular within their deficiency in the body.
  - **Biogenix® – the Next Step In Sport Nutrition™** – the brand is characterized by rapid implementation of products based on newly discovered nutrients, with fully researched health safety and proven effectiveness in supporting the promotion of health and stress adaptation.
  - **DOMINATOR® – Nutrion for the strongest** – Innovative line of dietary supplements and nutritions prepared in cooperation with Mariusz Pudzianowski. The basis for implementation of the new product are both medical research and opinions of practitioners, that is, athletes using every day different supplements and nutrients. DOMINATOR® Olimp is a comprehensive, multicomponent,

Małgorzata Miśniakiewicz, Sergii Kasian, Jacek Łuczak innovative products, which consist of high doses of the most active forms of the most effective ingredients of proved strength, weight, and physical work capacity, targeting sportsmen and young, ambitious strength sports adepts.

- **Olimp Fight** – products of this line are designed to accelerate the progress of training by enhancing the regeneration of post-workout and increase the body's ability to extreme effort, designed especially for people practicing martial arts.
- **Olimp Go For It** – line of supplements designed specifically for people who live actively, at high stress, practicing amateur all kinds of physical activity, and who value their health.
- **MEGA CAPS®/MEGA CAPSULES®** – concentrated dose formulations contain the active laboratory selected ingredients to maximize their effect. This makes it possible to limit the number of portions consumed daily ration.
- **Xplode** – series of products with very high solubility and intense fruit flavors that can be combined and compose with their own discretion. Use the maximum micronization forms of bulk is a component of a perfect assimilation of active ingredients of products in the series.
- **Therm Line** – line of products for people with intensive slimming.

Distribution of these brands is realised by:

- Perfect Body Center – Poland's first professional sales and nutritional counseling – supplementation, operating under the sponsorship of Olimp. Offers a wide range of the highest quality nutritional supplements, dietary supplements, functional beverages and accessories and sportswear brand renowned worldwide. They also offer free professional advice Diet, arrange individual training plan and a proper diet;
- Olimp Sport Nutrition Center – a network of reference sponsorship centers of Olimp brand (shops, fitness clubs, gyms), which contains the entire range of business and professional nutrition counseling and training;
- Authorized e-stores.

**2. Multipower** – German company for over 30 years producing nutrients and supplements for athletes and people who care about good health, slim figure and health. It is an undeniable leader in the European market. All

Multipower preparations meet the stringent German quality standards. For production use only materials of the highest quality. Multipower supplements are free of any banned doping agents and can be used by athletes of all sports. In Poland, the company delivers a number of clubs, specialty shops and fitness. This ensures good conditions for cooperation and fast processing time of orders. The company offers the following brands:

- Active – products for endurance athletes;
- Body – products for people who want to get in shape and well-being;
- Muscle – products for people with sports strength and strength-endurance.

3. **VEN-NATURA** – the company since 1998, is engaged in the distribution and sale of the Swedish nutrients for athletes – **VITARGO®**. It is certified for the health and purity of the product by the recognized international sports organizations, among others, IOC or IOC. All products offered by VITARGO VEN-NATURE products are manufactured and packaged in the original packaging in Sweden. VEN-Natura collaborates with physicians, physiologists and carers of national teams, has a full range of original products: conditioner Vitargo, including Gainers Gold and Professional, energy bars and energizing gels.
4. **Regis** – manufacturer of ActivLab – line of nutrients and supplements for athletes and active people, and also for anyone who wants to improve their fitness, health, beauty and vitality. The company offer includes preparations of supporting reduction of body fat, increase strength and muscle mass, as well as energizers, vitamins and minerals, supplements modern type of "anti-aging" and regenerators joints. ACTIVLAB brand includes also functional food and diet. Guarantee the best quality and effectiveness ACTIVLAB brand products are: over 20 years experience in the technology industry manufacturer of food, three own laboratories who care about the quality and effectiveness, engagement of researchers, enthusiasts employees of the company working in product development, innovation – collaboration with research centers in Poland and world, studies the effects and efficacy of products from ACTIVLAB confirm the quality and innovation, innovation in Poland and Europe marketing solutions for new product concepts customer made – products created and created jointly with clients (from recipes, the packaging, labels), transparency.
5. **Weider** – one of the world leaders in nutritional and dietary supplements for athletes, bodybuilders, and all those who play sports. The company is one of

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the most popular brands in the world, and its products are present on the market for over 70 years.

6. **Nutrend** – a leading manufacturer of nutritional and dietary supplements not only for athletes but also for all who enjoy an active lifestyle. The company is located in Olomouc in the Czech Republic, a branch in Poland is located in Bielsko-Biala. A significant part of the mix is directed to people practicing professionally and why the company places great emphasis on the effectiveness and quality of the ingredients used. The products do not contain substances on the WADA list, and the raw materials are purchased only from reliable suppliers in the long-term cooperation to ensure full safety of their use. Wide range, the highest quality and proactive in the fight against doping in sport is the basis for success, making its brand NUTREND strictly among the best producers of nutrients and supplements for athletes. NUTREND products are available in fitness clubs, stores nutrients and healthy food, bicycle shops and online stores. Brands offered by NUTREND are:
  - **Bodybuilding** – complete range of products for people who practice bodybuilding, fitness, strength sports and martial arts, both for beginners and professional athletes (series Compress Expand);
  - **Endurance Sport** – specialized series of products designed for people practicing endurance, speed-endurance, team sports;
  - **Weight Reduction** – fat burners are products that support the intense training to build muscles without a bit of pure fat. Accelerate the achievement of the desired effect during the training periods, sculpture and reduce body fat.
7. **POLAR PHARMA Finland** – manufacturer of nutrients and Gutzy supplements targeting at athletes and amateurs mainly in endurance sports such as running, cycling, tennis, fitness, skiing, etc.. Company offers a full line of the highest quality supplements divided into three parts: before training (Gutzy Energy Loader ), during (Gutzy Sports Drink, Gutzy Energy Bar, Gutzy Sports Gel), and after training (Gutzy Recovery Drink, Gutzy Recovery Bar). They are dietary carbohydrate and carbohydrate-protein ones. Gutzy products can be purchased at good sports shops, supermarkets and health food stores.
8. **Isostar** – company exists since 1977. Its mission is to create new, more effective products, which complement a balanced diet is necessary for maintaining the health of the athlete and support the body before, during and

after exercise. Isostar has its own committee of experts in the field of sports medicine – research focuses on products and fitness sports and are conducted in the best European laboratories.

- 9. Maxim Sports Nutrition** – is a Dutch company involved in creating the highest quality regenerative and energy supplements and nutrients for athletes and people with active lifestyles. In 1991, Maxim used the energy power of carbohydrates and developed a high-energy nutrient Maxim Energy Mix Original-containing cleaned up the highest grade of maltodextrin or carbohydrates containing one of the longest available polymer chains. Knowledge, continuous research and the experience gained in professional sports put conditioner in a row of leading carbohydrate supplements for athletes. Today, many athletes appreciate perfect quality of energy supplements, their proven effectiveness, taste and affordable price. Using the experience with professional athletes, the company developed the concept of energy products, the fruit of which are now: electrolytic drinks, energy bars, energy jelly beans, regenerative drinks and candy bars.
- 10. ENERVIT** – company founded over 50 years ago, produces of nutrients for athletes and active people who want to keep fit. All Enervit products are manufactured in the factory in Italy. Ingredients used in the manufacture are of the highest quality. Quality control is carried out at all stages of production. Each product is tested within the company by a special section called Equipe Enervit, acting in collaboration with leading athletes. The company's strategy is to create specialty products for the sports (marathons, running, triathlon, tennis) before, during and after training and during competition. Raw materials used for production are of the highest quality and do not contain GMOs.
- 11. Nestle** – PowerBar manufacturer – brand that offers a wide range of products for both professional athletes and people dealing physical activity as a hobby and a good way to spend free time. A rich assortment of products, including energy bars, protein bars, candy bars carbohydrate-protein, low-carb type bars, gels, ready to drink with L-carnitine, sports drinks, ready-protein drinks and traditional forms of protein products is dedicated especially endurance athletes (running, cycling) and team sports (football, handball, basketball, volleyball). Power Bar products combine high quality materials, solid production Nestle and great taste. Power Bar is the perfect preparation of the body for physical activity and support its regeneration after training.



**12. Vitalmax** – company engaged in the production, implementation and distribution of a new generation of sports nutrition. When creating new products they arrange the latest technologies used in major laboratories. Their products are based on the best components that have come from all over the world. Nutrients Vitalmax found their place in several European countries (Czech Republic, Slovakia, Poland, Lithuania, Latvia, France, Germany, Spain, United Kingdom), where both are used by people involved in amateur physical recreation as well as by professionals. On the Polish market are present since 2003. At the beginning of their activities competed with several products. Now, in terms of the dynamics of development are at the forefront, for example as one of the first companies in the world bought a technological line for the production of Mega Capsules and also as one of the few offer their nutrients, divided into portions, in the form of sachets, in the most hygienic and comfortable form of administration.

One reason for explosive growth of sports performance supplements is a changing product market focus. Traditionally, sports endurance supplements were heavily geared towards body-building and professional athletes. However, sales of sports nutrition products have now expanded to reach multiple fitness categories. The industry has expanded to include individuals that participate in recreational workouts and sports.

Historically, sports performance products have been geared towards male consumers; however, today's user of sports nutrition products is evenly split between genders. Those, the biggest challenge for most sports nutrition companies is expanding their product range to go beyond lines designed specifically for men. For those manufacturers that have tried to reach the female demographic, the end product has simply been an existing male product that is relabelled. There is also a lack of specific marketing for that segment [Światowy rynek... 2014]. There has also been growth within the youth segment for sports performance supplements – a recent study performed by the National Health Interview Survey shows that 1.6%, or 1.2 million kids, are now users of sports performance formulations [Światowy rynek... 2014]. These changing demographics of the typical sports endurance supplement user has been responsible for the growth of the base market for sports supplements, and in turn, helped to fuel the explosive sales growth seen in this category.

With a great deal of innovation within the sports supplement industry, the blurring lines between professional athlete needs versus that of the recreational exerciser, as well as increasing evidence of the efficiency of many sports performance formulations, the sports nutrition industry will continue to

flourish and prove to be a segment worth investing in. With a wide selection of product offerings available within this industry, supplement distributors should consider adding these popular categories and/or formulations to their product lineups.

The future of sports nutrition growth lies in engagement; accessibility and transparency. The popup store provides a retail format that has the ability to connect with the consumer in a local environment which they are familiar with [Maughan, Depiesse, Geyer 2007].

Meanwhile, a more stringent regulatory background in the West is increasing the pressure on manufacturers to find emerging markets that present an immediate growth opportunity. The Middle-East Europe countries present a huge opportunity.

Finally, the ability to utilize legislation as a benefit to the sports nutrition industry has been overlooked. Engagement with the legislative process and the utilization of food law against competitors can drive brand strength [Światowy rynek... 2014].

In the article, particular attention was paid to the market of carbohydrate supplements, especially demanded by runners, although some of them do not appreciate the importance of carbohydrates in systematic training and increasing the efficiency of the organism.

## **5. Carbohydrates supplements in the runners' nutrition**

Carbohydrates in the diet of athletes, both professional and amateur athletes regularly practicing sport are the cheapest, easily digestible, easily assimilable and most economical source of energy. It is generally accepted that carbohydrate intake during exercise increases the efficiency of the body during intense exercise lasting more than two hours, as well as shorter (approximately hourly) [Bean 2005; Burke, Loucks, Broad 2006].

Benefits from reaching for sports drinks and carbohydrate snacks during exercise rely primarily on saving glycogen, maintaining blood glucose at a stable level, delay compensates for the effect of dehydration and fatigue.

Despite their important role in the runners' nutrition studies have shown too little consumption of carbohydrates. Therefore, it is advisable to use targeted carbohydrate supplements that will support the players before the start, after about 2 hours effort, such as the marathon, half marathon, triathlon and immediately after exercise (recovery of glycogen) [Celejowa 2008].

Well – chosen carbohydrate nutrient should provide energy, which in a very short time will: gather a large dose of glycogen before take-off, increase

Małgorzata Miśniakiewicz, Sergii Kasian, Jacek Łuczak endurance during exercise, continue to run in the assumed rate and avoid the impending crisis and allow for accelerated recovery – glycogen synthesis.

Market of carbohydrate supplements in Poland is quite rich, emerging, although disordered (mix of all possible substances). There are no clear indications for their use and a clear description of the results to which they lead. The most popular carbohydrate supplements available on the Polish market due to market analysis are:

### 1. within the products offered by the Olimp company:

- **Olimp CARBONOX** – carbohydrate nutrient most often acquired in Poland, which is a combination of carbohydrates, selected according to precisely defined profiles of the rate of digestion and release of sugars into the bloodstream. Laboratory-selected proportions of carbohydrate sources with high (glucose) and medium (maltodextrins) and low (innovative isomaltulose of extended release) glycemic indexes ensure the stable saturation of the blood with the energy ingredients for a period of two hours since the adoption of the preparation. The high content of isomaltulose and maltodextrins ensures maintaining a stable insulin level during exercise, at a stable level, ensuring effective supply the working muscle cells of necessary energy ingredients. Carbonox is also enriched with L-arginine, which especially effective acts in increasing the production of nitric oxide affecting the widening of blood vessels, that has been scientifically proven many times and a complex of 12 vitamins, which significantly increases the absorption of carbohydrates and intensifies the metabolic transformations. In addition, high antioxidant potential disclosed by some of the vitamins stops the training damage to structural proteins of muscle cells, accelerating at the same time, at the molecular level regeneration.
- **OLIMP Fire Start Energy Gel** of cherries flavor and **Olimp Home Fire Endurance Energy Gel** with orange flavor – a concentrated source of energy for physically active people to eat before and / or during the grueling training and / or competition. Each sachet contains 45 grams of carbohydrate derived from six different sources, and thus with different absorption, further 2.7 g of protein, and in addition Fire Home Energy Gel enriched in MCT oil, beta-alanine and glucuronolactone.
- **Olimp Dextrex Juice®** of apple, lemon or orange flavor – a complex pharmaceutical dextrose, micronized taurine supplemented

with magnesium. The composition is, among others, to optimize the operation of creatine. Creatine supplementation leads to increase the rate of renewal of ATP in the muscle cells, which in turn may result in an increase in strength and muscle mass.

**2. within the products offered by the MULTIPOWER company:**

- **Multipower Multi Carbo Boost+** of orange flavor – concentrated energy gel contains 52 grams of carbohydrates, 50 mg of caffeine, BCAA's and B vitamins. Multi Carbo Boost supplies the body with sustained energy and thus reduces the risk of occurrence of a sudden burst of fatigue during training or competition. BCAA protect muscles during intense exercise, shorten the recovery period. Caffeine stimulates the high level of concentration and helps to overcome fatigue.
- **Multipower Multicarbo Gel** – Energy Gel 40g (taste apple, orange, strawberry-lime) – a carbohydrate gel with sodium and potassium. It provides 26 grams of carbohydrates. Contains fructose and maltodextrin which provide instant and long-lasting energy boost. Practical single sachet with ergonomic shape allows delivery of carbohydrates during the run, climbing, cycling.
- **MULTICARBO BAR + FRUIT** (available flavors: apple, banana, strawberry-vanilla) – Energy bar containing carbohydrates with different absorption. Quickly provides energy and at the same time provides a constant, steady flow of its for a long time.
- **MULTICCARBO JELLY** – practical to use energy jelly bean of orange flavor. It provides 29 grams of carbohydrates with different absorption. Sucrose gives an instant energy boost. In contrast, palatinose, which is characterized by a slow absorption rate ensures long-lasting energy boost.

**3. within the products offered by the VITARGO company:**

- Vitargo energy gel (available flavors: orange, lemon, cola) – In accordance with the manufacturer's declaration the world's first energizing gel based on a formula Vitargo – a unique combination of carbohydrates, which provides muscles with quick energy supply working. Vitargo Gel is an excellent addition to a sports Vitargo drink.
- Energy bars: VITARGO Performance Bar (vanilla), Vitargo Protein Bar (chocolate), VITARGO Endurance Bar (caramel), VITARGO Complete Bar (caramel + chocolate).

**4. within the products offered by the Nutrend company:**

- **Nutrend CARBOSNACK** – flavors: lemon, apple, caramel, apricot – tasty gel for athletes and active people physically and mentally, which is the energy source of the effect of sustained release of various forms of carbohydrates. CARBOSNACK can be applied before, during and after exercise. The effect of taurine enhances energy limiting fatigue and glycine supports the muscles.
- **Nutrend ENDUROSNACK** – flavors: orange, apricot, pineapple, apple, eucalyptus + kiwi – Specialized energy gel with the addition of all types of nutrients used by the body during endurance exercise: carbohydrates, MCTs, selected amino acids and active substances. ENDUROSNACK supplies the body with energy. ENDUROSNACK energy gel for use during competitive sports exercise, taking into account the body's need for energy. ENDUROSNACK is intended to supplement the energy before, during and after exercise.
- **Nutrend Power Bike Bar** and **Nutrend Mini Power Bike Bar** – flavors: caramel, passion fruit, cherry, vanilla – bar with a balanced nutritional and energy value. Indispensable in endurance sports: cycling, long – distance running, mountaintourism. It serves as an energy snack before and during exercise. It contains the optimal ratio of simple and complex carbohydrates, BCAA protect muscles during exercise, vitamins and minerals.
- **Nutrend Voltage Energy Cake** – flavors: exotic, hazelnut – a candy bar – based on energy cereal grains intended to supplement energy during prolonged physical activity. Energy on the route with a dose of gradually assimilated carbohydrates (unique solution – Palatinose) and vitamin C, E and zinc. The bar VOLTAGE

ENERGY CAKE has a unique composition, including a special type of carbohydrate – isomaltulose (Palatinose™), exhibiting a gradual assimilation, high energy potential and minimal impact on the osmolarity of the gastrointestinal tract.

**5. within the products offered by the Gutzy company:**

- **Gutzy SportsGel Energy Gel** – flavors: cola + caffeine, Strawberry – Contains maltodextrin and glucose-fructose syrup. This combination ensures rapid assimilation, but also long-lasting energy boost. Supplements salts, sodium, and magnesium that we lose during exercise and sweating. Helps maintain fluid balance in the body. Gutzy Sports Gel is ideal for cycling, cross-country skiing and all other endurance sports.
- **Gutzy Energy Bar** of strawberry – chocolate, mint – chocolate flavors. The high content of carbohydrates and low fat content makes it a high-quality energy boost for all sports lovers. GUTZY energy bars, increase energy efficiency, durability and long operation by delaying fatigue.

**6. within the products offered by the Isostar company:**

- **ISOSTAR Actifood energy gel** – flavors: exotic, apple, fruit. Gel Actifood instantly provides with its superenergetic formula – 97.5% carbohydrates energy and covers 70% of the recommended daily requirement of vitamin C and E, 16% for vitamin B1 – it is recommended during intense exercise. Moreover, it is completely free of fatty substances, which allows faster the absorption of the carbohydrates. It consists of unique pieces of fruit, which makes the product more palatable. It is recommended to consume fruit gel Actifood during training, and intensive, frequent or prolonged exercise.
- **Isostar HIGH Energy jelly of strawberry flavor**. It refreshes thanks to three times greater than in natural coffee concentration of caffeine. This is the strongest naturally occurring foodstuff containing caffeine. Increases energy and saves glycogen in liver and muscle by burning fat. During the diet suppresses the feeling of hunger. Designed to provide immediate, easily digestible dose of energy during intense exercise.
- **Isostar Pulse Bar** – flavors: chocolate, nuts + chocolate candy bar with chocolate milk and guarana. The unique combination of

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crunchy cereals rich in carbohydrates, quickly replenished during exercise. Guarana is refreshing, thanks to three times greater concentration of caffeine than in natural coffee. According to the manufacturer's declaration combination of the vitamins, protein, fat and carbohydrates with guarana is the best combination for practicing any sport. Guarana increases the strength, so you can train longer and burn more fat. Refreshes before exercise and stimulates during it.

#### **7. within the products offered by the Maxim company:**

- **Maxim Energy Gel** – flavors: strawberry, orange + guarana, citrus – Maxim Energy gels are designed to deliver rapid energy at a specific time during intense exercise. The concentrated gel pack includes a fast release of 70% carbohydrates, which are immediately absorbed by the body and deliver an extra dose of energy.
- **Maxim Energy Bar** – flavors: banana / yogurt, caramel – energy bar contains 70% carbohydrates, and fruits, whole grains, glucose syrup and maltodextrin and a negligible amount of fat. The combination of simple and complex carbohydrates provide a rapid energy dose, release continuously needed for a full, long training.

#### **8. within the products offered by the Enervit company:**

- **Enervitene Sport Gel BCAA** – flavors: lemon, citrus and caffeine, orange, cola – energy gel designed for endurance sports (skiing, cycling, marathons ...) and team (football, basketball volleyball, etc..). With a blend of maltodextrin, glucose and fructose ensures fast delivery of energy without the risk of raising blood sugar levels, causing hypoglycemia. Vitamins B1, B2, B6, niacin ensure proper metabolism of carbohydrates and amino acids BCAA protect and regenerate muscles against depleted during exercise. One pack contains 25mg of caffeine, which has a beneficial effect on carbohydrate metabolism during and after exercise endurance.
- **Enervit Concentrate Enervitene** – flavors: lemon, orange – energy flowing from concentrate Enervitene is felt very quickly, what I smore the more complex molecules of fructose ensure the supply of energy at a constant level. As used during exercise provides very fast and uniform supply of energy for a long time of about 1 hour.

All the data presented above are the results of the analysis of the labels placed on the products packages and leaflets attached by the their producers to the products.

## **6. Dietary additives, sports food – the analysis of the Ukraine market**

Croatia Ltd is specialized trade company in Ukraine, which delivers and wholesale, by retail dietary additives and sports nutrients. Quality and experience of this company is shown by its portfolio – the company has performed more than 350 marketing authorizations of medical devices of different areas, more than 200 medicinal products and more that 200 food supplements and cosmetic products. Cratia Ltd has established state registration of special food products (dietary food supplements, sports meal) and cosmetic products manufactured by following companies: Topicrem, Spider Pharm Industries Ltd, Beres Pharmaceuticals CO Ltd, Grindex, SLAVIA Pharm, pharmaceutical company Vertex (Вертекс фармацевтическая компания), Nikopharm (Никофарм), BF-esse, DietMed natural products, Dr Svharzenbach, Ecomyr, Galenofarm (Галенофарм), GreenClever, Labofarm, Lavena, LifePh arm Global Network, Megacom (Мегаком Содействуем здоровью), SeboCalm, Veropharm, Vilavi [Our partners and.... 2014].

Since 2009 Cratia is a member of European Business Association. Company's portfolio includes more than 700 registered medical devices, more than 350 medicinal products, active substances, more than 250 food supplements and cosmetics.

Submission of official documentation to the state authorities of Ukraine [МОН, State Expert Center, State Agency of Medicinal Products] requires presentation of such documents in the legalized form. Requirements for the legalization of document depend on the country of origin. Official documents mean documents that grant rights or obligations (such as Power of Attorney), specific certificates and licenses. For registration of medicinal products following documents are usually legalized: Power of Attorney, GMP certificate, Certificate of Pharmaceutical Product (CPP), Manufacturing License. For registration of medical devices following documents are usually legalized: Power of Attorney, Quality management system certificates (such as ISO), CE mark, Certificate of registration of legal entity. Cratia Ltd provides assistance in the registration of medicinal products, medical devices and medical equipment, food supplements and cosmetics. [Legalization requirements.... 2014].

To simplify some obligatory moments in life of the athlete many supportive meals are developed in Ukraine. Among them one of the most important is the shaker for sports food. The sports shaker is developed for



Małgorzata Miśniakiewicz, Sergii Kasian, Jacek Łuczak cocktails for optimum mixing of ingredients and creation of uniform and easily acquired drink. Most often within it is possible to find a grid made of food plastic which allows to mix carefully dry mix with water, juice or any other liquid. Carbohydrates for athletes: Carbo Nox. Producer: OLIMP Labs (Олимп). Carbo Nox from Olimp – the drink capable quickly to deliver energy to the athlete. It contains carbohydrates of various length of a chain that promotes uniform assimilation and provides an organism with fuel on a long period. Packing of 1000 grams, the price is 160 UAH.

Carbosnak from the producer of Nutrend is a pleasant gel on the taste intended for physically tired people who can use it as a power source with noticeable effect of the prolonged absorption. Carbosnak is power gel for fast providing an organism with energy with taurine and glycine addition. Basis of a product are simple sugar (fast energy) in combination with the maltodextrin, presented in practical packing in the form of a tube which can be opened several times. Taste options: bilberry, caramel, apricot, green apple, bitter lemon, blue energy. Packing: tube – 55 grams, a bag – 55 grams. The price 50 UAH is offered on the market together of 12 tubes or bags on 55 grams in a box.

Olimp Dextrex Juice. DEXTREX Juice® contains a dextrose, taurine and magnesium. The dextrose – the simple sugar increasing balance of energy it is suitable for physically active people and athletes. Packing of 1000 grams, the price is 160 UAH. Producer: OLIMP Labs (Олимп). CarbBX from the producer Olimp Sport Nutrition contains carbohydrates with the differentiated glycemic index. Production is applied in sports that to compensate energy loss during trainings and glycogen fall after training [Carbohydrates for athletes..., 2014].

Isotonic and hypotonic drinks (isotonic) are concentrates of drinks with support of balance of salts in the organism, power and stimulating effects. Sports isotonic drinks are created for active people and athletes as an optimum source of endurance at the increased sweating. Professional athletes use isotonic drinks instead of water is considerably improves their health and endurance decisive minutes.

Isostar drink is the sports drink made by world famous firm Novartis since many years. The Izostar promotes improvement of sports results, satisfies thirst. Isostar drink is the new isotonic formula providing athletes with necessary minerals (magnesium and calcium) in optimum concentration. Both magnesium, and calcium are necessary for normal functioning of muscles. The Izostar quickly and effectively supplies muscles with these vital minerals, thereby increasing endurance, improving power indicators, preventing spasms and accelerating restoration after training. Sports Isostar drink provides athletes

with necessary liquid and energy during training. This drink is acquired quicker, than water or tonic soft drinks. This drink is delivered in retail network in Ukraine in packings of 400 grams at the price of 185 UAH. (Sports drinks [Isotonics, Energy Drinks.... 2014].

We notice that the majority of dietary additives and food for athletes in Ukraine are presented by import production, which distributes in the markets by means of distributors, retail sellers. Recently Internet trade is widely developed in Ukraine.

The leading Internet-shop of sports food and goods for athletes in Ukraine is SportPower.Com.Ua. This shop for many years actively acquaints the Ukrainian athletes and fans with novelties of the sports food, new qualitative food additives and accessories. This firm offers the Ukrainian consumers the most famous American and European brands of high quality sports food, such us: Advanced Formulations, All American EFX, Axis Labs, BioTech USA, BSN, Cellucor, Cytogenix Xenadrine, Dream Tan, Dymatize Nutrition, FA Engineered Nutrition, Gaspari Nutrition, GAT (German American Technologies), Hansa-X-Sport, Hyper Strength, Inner Armour Black, Inner Armour Blue, InterACTIVE Nutrition, Isostar, LegalGear Sciences, MadMax, Maxx Essentials, MHP, Mordex, Multipower, Muscle Asylum Project, MuscleMeds, MuscleTech, Myogenix, Natures Science, NOW Foods, Nurtend, Nutrabolics, Nutrex Research, OLIMP Labs, Optimal Results, Optimum Nutrition, Performance Nutrition, Pharma First nutrition, Power Man, Primaforce, Pro Nutrition, QNT (Quality Nutrition Technology), Reflex Nutrition, Revolutions Nutrition, SAN Nutrition, SciFit, Scitec Essentials, Scitec Nutrition, Scivation, SportPower, Syntrax, ThermoLife International, Twinlab, Ultimate Nutrition, Universal Nutrition, USPlabs, VitaLife, Vivasan, VPX Sports Nutrition, Weider, Xero LimitsTM.

Quality of production in the Ukrainian market is guaranteed by cooperation with the leading importer of sports food “OLTA LTD” (Fitness Factor trademark) and confirmed with official certificates of quality. The Scitec Nutrition firm developed also special web form of check of authenticity of a product according to serial number and a date of issue on packing The official site of The Internet Shop “Sport Power” [Certificates... 2014]. To buy sports food in Kyiv and other cities of Ukraine it is most convenient on the Internet.

## **7. Recommendations in practices of organization of marathon in Ukraine**

Nowadays, every athlete must be aware the necessity to supply the body with the right amount of fluid and nutrients during endurance competitions or

Małgorzata Miśniakiewicz, Sergii Kasian, Jacek Łuczak training. A healthy and varied diet that is adapted to daily needs of athletes will give them a good results. Together with targeted sports nutrition strategy BEFORE, DURING and AFTER training, athletes can get them the most out of training and improve performance. As an example the nutritional recommendations by the organisers of Kiev Marathon are presented in Table 5.

Table 5. Phase and recommendations concerning sports nutrition in practices of organization of marathon in Ukraine

<b>Phase</b>	<b>When</b>	<b>What</b>	<b>Recommendations</b>
1. Before	Up to 60 minutes before	Carbohydrate-rich drinks or snacks with sufficient fluid (water or isotonic drink)	<ul style="list-style-type: none"> <li>– White bread with honey + fluid,</li> <li>– Ripe banana + fluid,</li> <li>– Energy bar (Voltage, PowerBike bar + fluid),</li> <li>– Isotonic drink,</li> <li>– Energy gel (Carbosnak, Endurosnaek)</li> </ul>
2. During	Drink and eat little and often (e.g. drink 150-200 ml every 15 minutes). Start drinking as soon as possible and do not wait until you are thirsty	Snacks and/or drinks that are rich in carbohydrate	<ul style="list-style-type: none"> <li>– Isotonic drink (Isdrink),</li> <li>– Energy Gel (Carbosnack) + fluid,</li> <li>– Energy shot (Gutar) + fluid;</li> <li>Energy Bar (PowerBike Bar, Voltage) + fluid</li> </ul>
3. After	Immediately after	1-1.2 g carbohydrates per kg of body weight, plus approx. 20-25 g protein and sufficient fluids	<ul style="list-style-type: none"> <li>– Flavoured milk drink and dried fruits,</li> <li>– Semolina or rice pudding + fluid;</li> <li>– Regener drink,</li> <li>– Protein Bars (Excelent Protein Bar, Low Carb Protein Bar) + fluid</li> </ul>

Source: Trainings... 2014

The three key principles of a sports nutrition strategy for endurance athletes are:

- Hydration – supply of the body with sufficient fluids,

- Energy – fuel for muscles,
- Recovery – nutrition strategy to optimize regeneration and help promote training adaptations.

## **Conclusions**

Among numerous factors which determine the quality of running events the aspects related to motivation, organization, infrastructure, schedule and others should be enumerated. Many participants indicate their goals – improving their achievements. Since a certain moment trainings and results are greatly dependent on the proper diet including its appropriate supplementation.

Increased physical effort, which accompanies sport practice, requires more energy and many nutritional ingredients. Although, scientific research shows that a properly prepared diet based on natural products is sufficient to provide increased energy and all necessary nutritional ingredients, athletes should take supplements, particularly when they are in intensive training.

The motivations of athletes participating in running events are very diverse. The more "serious" they treat their take-offs and training, the greater role is played by the nutrients. Trend of products' professionalization, which is typical for the countries in which we see very mature cross-country events, no doubtly, with the development of the events, will occur soon in Central and Eastern Europe. In Poland, nowadays it is much more visible comparing to Ukraine, for instance.

Constantly growing market of sport supplements offers an extremely wide range of products. Moving in such a vast range and making the right choice, is a big problem even for the experienced athlete, not only for the amateur ones and all interested in a healthy lifestyle. Unfortunately, there is a big problem with getting to the reliable information and making an informed choice in this area. Therefore, it is necessary to conduct extensive research in the field of quality of nutritional supplements for athletes and the education of persons involved in amateur sport, particularly in because of the mass scale, running, regarding their selection and use. Appropriate action in this scope may significantly increase the satisfaction of this form of physical activity and help to improve ones results.

It should be emphasized that nutritional supplements for athletes and physically active people can be a valuable, yet complementary nutrition and training treatments aimed at improving exercise capacity and improve the body composition profiles. Contrary to the advertising slogans they are not determinants of the progress efficiency, only additives that may to some extent

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accelerate progress. When going on a shopping it is important to use common sense in trying to buy only proven and needed products.

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