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THE ECONOMIC SUBSTANTIATION FOR PRODUCTION OF GASTRIC TEAS AS PROMISING MEDICINES FOR TREATING GASTRO-INTESTINAL TRACT DISEASES

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Key words: gastric tea; gastro-intestinal tract; treatment of diseases; economic substantiation; production

The dynamics of gastro-intestinal tract diseases has been investigated in the article. The methods of treatment of these diseases have been studied. The marketing analysis of phytoteas has been carried out. The composition of phytoteas presented at the Ukrainian pharmaceutical market has been studied. The composition of phytoteas used for gastro-intestinal tract disorders has been developed and suggested. The approaches of the economic substantiation of reasonability for production of the phytoteas suggested are given. The prices for these phytoteas have been substantiated, and their prime cost has been calculated. The economic efficacy of the research on development of the phytotea composition has been determined.

Diseases and disorders of the gastro-intestinal tract (GIT) represent a very important part of clinical medicine research due to their high prevalence among the patients, complexity of pathogenesis, the lack of effectiveness of the existing treatment methods and the relapsing course of these diseases. Gastroenterology achievements, search, directed synthesis and the study of the new effective medicines show that the problem of GIT diseases treatment is of great importance and interest at the moment [8, 14].

Medicinal plants (MP) and teas on their basis occupy a special place in the complex therapy of GIT diseases. This is due to the fact that phytotherapy is well tolerated by patients and almost does not show side-effects. MP teas can be taken simultaneously with other treatment methods suggested by modern medicine that allows patients to recover quicker and more effectively. In some difficult cases the use of phytotherapy in parallel with pharmacotherapy increases not only the effectiveness, but also the safety of treatment. Such effect can be explained by the membrane stabilizing action and elimination of metabolites, toxins and cellular decomposition products with the blood circulation from the human organism. In some cases if there are no symptoms of acute inflammation, phytotherapy can be chosen as main therapy. It is also used for the relapsing course of GIT diseases prophylaxis in case of their chronic course.

The use of MP teas is especially of a great interest at the moment while the anti-terroristic operation at the Eastern territories of Ukraine is taking place. The main part of surgeries requires rehabilitation. The long period of rehabilitation requires application of medicines with a soft action and few side effects. The irregular and unbalanced diet (especially during military campaigns) can become the cause for exacerbation of chronic diseases [15].

Medicines of the plant origin have been traditionally used in Ukraine for centuries. Nowadays, the use of phyto-

therapy is very urgent not only because of its proven effectiveness and minimal side effects (it becomes extremely important during the long-term treatment), but also because of the low price of these medicines.

These days there is a crisis in Ukraine in providing the population with medicines with the low price and good quality. The patients' incomes decrease while prices on drugs increase. According to this fact, the volume of drug consumption in Ukraine is determined not only by the level of morbidity of the population and the needs of the healthcare system in medicines, but also by the purchase ability of patients [2].

During the last years there is a trend of GIT diseases increase. For example, the number of patients with this nosology in 2013 was 2764 persons per 100 thousand of the population, i.e. 1254856 people [2].

The results of the questioning conducted indicate the trend of the future consumption of phytoteas and teas by the patients will be approximately 55% despite the low level of solvency. In the expert questionnaire 352 patients took part. The number of patients who will use phytoteas for treating the digestion system disorders (the dosage form is teas in filter bags or cartons weighing 100 g) will equal approximately 690 thousand people [2, 16].

Materials and Methods

When conducting the research the legal, economic, marketing and pharmaceutical methods were used [6, 9, 14].

Results and Discussion

The main step of providing the population with drugs is substantiation of the production necessity of certain medicines. The economic substantiation for production expediency of phytoteas was conducted in three steps:

- the first step – marketing research of the pharmaceutical market;
- the second step – calculation of the economic efficacy of manufacturing of the phytotea prime cost;

- the third step – the economic substantiation of the scientific work efficacy [5-17].

Nowadays there are a lot of phytoteas for GIT treatment at the pharmaceutical market of Ukraine. The main manufacturers presented at the market are: “AIM” Ltd, “Kluchi zdoroviya” research-and-production pharmaceutical company, “Novaya formatsiya” Ltd, “Regionalnyi Tsentr Fitochayov” Ltd and others. Marketing research is presented in Table.

The research conducted shows the necessity of developing and introducing phytoteas for treating GIT diseases into manufacture at the domestic pharmaceutical enterprises despite their wide assortment at the market. On the one hand, this is due to the great amount of plants in the composition of a phytotea that can cause allergy. On the other hand, it limits the segment of consumers because of the prevalence of allergic diseases among patients. The third reason is high prices for the existing medicines.

Table

The comparative characteristics of phytoteas

The name of a phytotea	Manufacturer	Composition	Indications for use	Price, UAH
1	2	3	4	5
TianDe Phytotea “Gastric tea with marshmallow”	TianDe	<ol style="list-style-type: none"> Bergenia leaves (<i>Bergenia crassifolia</i>) Marshmallow root (<i>Althaea officinalis</i>) Angelica root (<i>Angelica sinensis</i>) Flax seed (<i>Linum usitatissimum</i>) Chamomile flowers (<i>Matricaria chamomilla</i>) Peppermint leaves (<i>Mentha piperita</i>) Licorice root (<i>Glycyrrhiza glabra</i>) Chicory root (<i>Cichorium intybus</i>) 	It restores the gastric functional activity and protects against organic diseases; improves the gastric mucosa state and normalizes digestion	56.00
“Gastro-intestinal” phytotea	Manufacturer “Krymskiy sbor”	<ol style="list-style-type: none"> Nettle (<i>Urtica dioica</i>) Rubus leaves (<i>Rubus subg Rubus</i>) Peppermint (<i>Mentha piperita</i>) Catnip (<i>Nepeta cataria</i>) Hyssop (<i>Hyssopus officinalis</i>) Lime (<i>Tilia cordata</i>) German chamomile (<i>Matricaria chamomilla</i>) 	It is a prophylactic medicine against GIT diseases	39.00
Gastro-intestinal phytotea “Gastrophyt”	AIM Ltd, Research-and-production pharmaceutical company	<ol style="list-style-type: none"> Calamus rhizome (<i>Acorus calamus</i>) Marshmallow root (<i>Althaea officinalis</i>) Helichrysum flowers (<i>Helichrysum arenarium</i>) Black elder flowers (<i>Sambucus nigra</i>) St. John's wort herb (<i>Hypericum perforatum</i>) Calendula flowers (<i>Calendula officinalis</i>) Nettle leaves (<i>Urtica dioica</i>) Peppermint leaves (<i>Mentha Piperita</i>) Wormwood herb (<i>Artemisia absinthium</i>) German chamomile flowers (<i>Matricaria chamomilla</i>) Pagoda tree fruit (<i>Sophora japonica</i>) Licorice root (<i>Glycyrrhiza glabra</i>) Yarrow herb (<i>Achillea Millefolium</i>) Sage leaves (<i>Salvia officinalis</i>) Cinnamon rose fruit (<i>Rosa cinnamomea</i>) 	It has spasmolytic properties; stimulates the reparative processes in the gastric and duodenal mucosa; regulates the GIT functioning; normalizes the intestinal motility; has the choleric and carminative activity	29.00
“Gastro-intestinal” phytotea	“Megan” Ltd	<ol style="list-style-type: none"> Calamus (<i>Acorus calamus</i>) Marshmallow (<i>Althaea officinalis</i>) Elecampane (<i>Inula helenium</i>) St. John's wort herb (<i>Hypericum perforatum</i>) Calendula (<i>Calendula officinalis</i>) Peppermint (<i>Mentha piperita</i>) German chamomile flowers (<i>Matricaria chamomilla</i>) Yarrow (<i>Achillea Millefolium</i>) Wild thyme herb (<i>Thymus serpyllum</i>) 	It has the spasmolytic, antibacterial and anti-inflammatory action; improves the GIT functioning; has tonic properties	25.00

Table continuation

1	2	3	4	5
Phytotea "Kurilskiy chai"	"Sibirskoye zdorovye" corporation	<ol style="list-style-type: none"> 1. Bupleurum herb (Bupleurum aureum) 2. Plantain leaf (Plantago major) 3. Cinnamon rose fruit (Rosa cinnamomea) 4. German chamomile flowers (Matricaria chamomilla) 	It has the regenerating effect on the digestive system; exhibits the choleric and hepatoprotective effects; normalizes the intestinal microflora; eliminates fats and cholesterol	35.00
"Phyto gastro-intestinal" phytotea No. 7	TM "Klyuchi zdorovya"	<ol style="list-style-type: none"> 1. Calamus rhizome (Acorus calamus) 2. Marshmallow root (Althaea officinalis) 3. Elecampane root (Inula helenium) 4. Pot majoram herb (Origanum vulgare) 5. St. John's wort herb (Hypericum perforatum) 6. Yarrow herb (Achillea Millefolium) 7. Wild thyme herb (Thymus serpyllum) 8. Peppermint leaves (Mentha piperita) 9. German chamomile flowers (Matricaria chamomilla) 10. Calendula flowers (Calendula officinalis) 	It normalizes the GIT functions	13.95
Gastro-intestinal phytotea No. 5 "Doctor+"	Krivosheyev K.G. Private company	<ol style="list-style-type: none"> 1. Cinnamon rose fruit (Rosa cinnamomea) 2. Nettle leaves (Urtica dioica) 3. St. John's wort herb (Hypericum perforatum) 4. Plantain leaf (Plantago major) 5. Peppermint leaves (Mentha piperita) 6. Common knotgrass herb (Polygonum aviculare) 7. German chamomile flowers (Matricaria chamomilla) 8. Stevia leaves (Stevia rebaudiana) 9. Yarrow herb (Achillea Millefolium) 10. Wild thyme herb (Thymus serpyllum) 11. Calamus rhizome (Acorus calamus) 12. Sage leaves (Salvia officinalis) 13. Chaga mushroom (Inonotus obliquus) 14. Lime flowers (Tilia cordata) 	It has the spasmolytic, antibacterial and anti-inflammatory action; improves the GIT functioning; has tonic properties	12.55
Gastro-intestinal phytotea No. 5	"Regionalny centr phytochayov" Ltd	<ol style="list-style-type: none"> 1. Cinnamon rose fruit (Rosa cinnamomea) 2. St. John's wort herb (Hypericum perforatum) 3. Wild thyme herb (Thymus serpyllum) 4. Nettle leaves (Urtica dioica) 5. Sage leaves (Salvia officinalis) 6. Peppermint leaves (Mentha piperita) 7. Lime flowers (Tilia cordata) 8. Plantain leaf (Plantago major) 9. Coltsfoot leaves (Tussilago farfara) 10. Calamus rhizome (Acorus calamus) 11. German chamomile flowers (Matricaria chamomilla) 12. Yarrow grass (Achillea millefolium) 13. Common knotgrass herb (Polygonum aviculare) 14. Chaga mushroom (Inonotus obliquus) 15. Stevia leaves (Stevia rebaudiana) 	It has the spasmolytic, antibacterial and anti-inflammatory action; improves the GIT activity; has tonic properties	35.95

Table continuation

1	2	3	4	5
«Gastro-intestinal» phytotea of Carpathian species	“Karpatskiy sbor” Ltd	<ol style="list-style-type: none"> 1. Common knotgrass (<i>Polygonum aviculare</i>) 2. Oats (<i>Avena sativa</i>) 3. Fireweed (<i>Chamerion angustifolium</i>) 4. German chamomile flowers (<i>Matricaria chamomilla</i>) 5. Peppermint leaves (<i>Mentha piperita</i>) 6. St. John's wort herb (<i>Hypericum perforatum</i>) 7. Rubus leaves (<i>Rubus</i> subg. <i>Rubus</i>) 	It is a prophylactic medicine against GIT diseases	30.00
“Gastro-intestinal with Iceland moss” phytotea	“Naturalis” company	<ol style="list-style-type: none"> 1. Iceland moss (<i>Cetraria islandica</i>) 2. Marshmallow root (<i>Althaea officinalis</i>) 3. Licorice root (<i>Glycyrrhiza glabra</i>) 4. German chamomile flowers (<i>Matricaria chamomilla</i>) 5. Dill fruit (<i>Anethum graveolens</i>) 6. Fennel fruit (<i>Foeniculum vulgare</i>) 7. Agrimony herb (<i>Agrimonia eupatoria</i>) 8. St. John's wort herb (<i>Hypericum perforatum</i>) 9. Wild thyme herb (<i>Thymus serpyllum</i>) 10. Common bilberry leaves and shoots (<i>Vaccinium myrtillus</i>) 11. Coriander leaves and fruit (<i>Coriandrum sativum</i>) 12. Oats straw (<i>Avena sativa</i>) 13. Common knotgrass herb (<i>Polygonum aviculare</i>) 14. Calendula flowers (<i>Calendula officinalis</i>) 15. Tormentil root (<i>Potentilla erecta</i>) 16. Peppermint leaves (<i>Mentha piperita</i>) 17. Nettle herb (<i>Urtica dioica</i>) 18. Common bean (<i>Phaseolus vulgaris</i>) 19. Marsh cudweed (<i>Gnaphalium uliginosum</i>) 20. Motherwort herb (<i>Leonurus cardiaca</i>) 21. Oak bark cut (<i>Quercus robur</i>) 22. Nettle leaves (<i>Urtica dioica</i>) 23. Sage leaves (<i>Salvia officinalis</i>) 	It relieves spasms of the stomach and intestines; relieves digestion; helps to restore the normal pancreas functioning; improves functioning of the liver and intestine; improves metabolism; relieves flatulence, belch and heartburn	25.00
“Sila rossiyskih trav No. 5” phytotea	“Vitachai” Ltd	<ol style="list-style-type: none"> 1. Cinnamon rose fruit (<i>Rosa cinnamomea</i>) 2. St. John's wort herb (<i>Hypericum perforatum</i>) 3. Nettle leaves (<i>Urtica dioica</i>) 4. Peppermint leaves (<i>Mentha piperita</i>) 5. Plantain leaf (<i>Plantago major</i>) 6. German chamomile flowers (<i>Matricaria chamomilla</i>) 7. Common knotgrass herb (<i>Polygonum aviculare</i>) 8. Stevia leaves (<i>Stevia rebaudiana</i>) 9. Yarrow herb (<i>Achillea millefolium</i>) 10. Wild thyme herb (<i>Thymus serpyllum</i>) 11. Chaga mushroom (<i>Inonotus obliquus</i>) 12. Sage leaves (<i>Salvia officinalis</i>) 13. Calamus rhizome (<i>Acorus calamus</i>) 14. Lime flowers (<i>Tilia cordata</i>) 	It has the spasmolytic, antibacterial and anti-inflammatory action; improves the GIT functioning; has tonic properties	15.00

Table continuation

1	2	3	4	5
Gastric tea prepared according to the ancient Monastery recipe	Belarus	<ol style="list-style-type: none"> 1. Calendula flowers (<i>Calendula officinalis</i>) 2. Flaxseed seed 3. Cinnamon rose fruit (<i>Rosa cinnamomea</i>) 4. St. John's wort herb (<i>Hypericum perforatum</i>) 5. Marsh cudweed (<i>Gnaphalium uliginosum</i>) 6. eppermint leaves (<i>Mentha piperita</i>) 7. Wormwood herb (<i>Artemisia absinthium</i>) 8. Equisetum herb (<i>Equisetum arvense</i>) 9. Yarrow flowers (<i>Achillea millefolium</i>) 	<p>The tea is used for treatment of any GIT diseases:</p> <ul style="list-style-type: none"> • chronic gastritis; • gastric and duodenal ulcers; • colitis of any etiology; • bacterial and fungal intestinal infections; • intoxications of different etiology – poisonings by poi-sons, drugs or alcohol; • defecation problems (constipation and diarrhea); • enzymatic insufficiency; • flatulence; • intestinal dysbacteriosis, etc 	230.00

That is why the second step is substantiation of the cost of the phytotea proposed. The prime cost calculation for production of 1000 packs of the gastric phytotea for conditions of the pharmaceutical manufacture "A" (confidential information) includes the following items:

1. The main plant raw material.
2. Auxiliary materials.
3. Salary, including taxes.
4. Manufacturing expenses.
5. Administrative expenses.
6. Sales costs (expenses).
7. Other operating expenses.

Full cost is 6721 UAH.

Thus, based on the calculations and marketing research conducted it has been determined that the optimal price of a phytotea per pack is 8.50 UAH. In such a case, the profit of the manufacture obtained, including the number of patients when they use only 1 pack of the phytotea equals 613755 UAH.

The third step is the economic substantiation of the scientific work efficacy. Expenses on the scientific work refer to production costs. They are one-time costs, which include such items:

- materials;

- energy costs;
- special equipment for research;
- main salary;
- additional salary;
- taxes on salary;
- business trips expenses;
- payment for utility services;
- expenses on work carried out by other organizations;
- other direct expenses;
- other overheads.

On the basis of the standard method [1, 3, 4] it has been determined that the research cost equals 145928.90 UAH, and the price of the scientific and technical production will be 185928.90 UAH. The profitability index of investments for assessing a scientific invention in the field of pharmacy is 0.27.

CONCLUSIONS

According to the research conducted the importance of development and production of the gastro-intestinal phytotea has been proven, its acceptable price has been determined, and the indicators of the scientific work efficacy have been calculated.

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ЕКОНОМІЧНЕ ОБҐРУНТУВАННЯ ВИРОБНИЦТВА ШЛУНКОВИХ ЗБОРІВ ЯК ПЕРСПЕКТИВНИХ ЗАСОБІВ ЛІКУВАННЯ ЗАХВОРЮВАНЬ ШЛУНКОВО-КИШКОВОГО ТРАКТУ

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Ключові слова: шлунковий збір; шлунково-кишковий тракт; лікування захворювань; економічне обґрунтування; виробництво

Досліджено динаміку захворюваності шлунково-кишкового тракту, розглянуті методи лікування цього захворювання. Проведено маркетинговий аналіз ринку фітосаїв. Досліджено склад фітосаїв, представлених на ринку України. Запропоновано склад фітосаїв для лікування кишково-шлункових захворювань. Наведені підходи економічного обґрунтування доцільності виробництва запропонованих фітосаїв. Обґрунтовані ціни на ці чаї та розраховано їх собівартість. Визначена економічна ефективність наукової роботи з розробки складу фітосаїв.

ЭКОНОМИЧЕСКОЕ ОБОСНОВАНИЕ ПРОИЗВОДСТВА ЖЕЛУДОЧНЫХ СБОРОВ КАК ПЕРСПЕКТИВНЫХ СРЕДСТВ ЛЕЧЕНИЯ ЗАБОЛЕВАНИЙ ЖЕЛУДОЧНО-КИШЕЧНОГО ТРАКТА

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Ключевые слова: желудочный сбор, желудочно-кишечный тракт, лечение заболеваний, экономическое обоснование, производство

Исследована динамика заболеваемости желудочно-кишечного тракта, рассмотрены методы лечения этого заболевания. Проведен маркетинговый анализ рынка фитосаев. Исследован состав фитосаев, представленных на рынке Украины. Предложен состав фитосаев, используемых для лечения желудочно-кишечных заболеваний. Приведены подходы экономического обоснования целесообразности производства предложенных фитосаев. Обоснованы цены на эти чаи и рассчитана их себестоимость. Определена экономическая эффективность научной работы по разработке состава фитосаев.