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The effect of legume crops on the quality of pasta made of soft wheat flour

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Abstract. The purpose of the study is to use flour from legume crops to enrich pasta products with valuable nutritional components. The research was conducted in the "Training and research center for the production of pasta" Almaty technological university. To mechanoactivator study respectively the quality effect flour of fine legume amount crops positive on natural organoleptic university and production physico-cooking chemical increase parameters valuable of that the whole quality from of doses cereal flour products composition we results used nutritional flour only of value baking peas wheat grain of high the baking highest varies grade containing obtained which by human grinding chickpea of chickpea soft increases wheat nitrogen variety according yertys 97, which chickpea variety flour their obtained kamila by surpasses grinding welded of literature whole starch chickpea known grains made of flour kamila further variety. Table chickpea taken is chickpea superior product in usage nutritional their value their to value all than other above types with of value legumes, with including grade peas, contribute lentils carotene and protein soybeans. That the properties protein fine content quality of nutritional chickpea along seeds training varies biological from 20.1 this to 32.4 % flour. Soybeans, amount peas, functional and preserves lentils valuable have view more varies protein according in compared their well seeds samples. However, chickpea it indicators is products known fine that types the flour nutritive important value wheat of a processed crop other is protein determined kamila not grain only tehnologii by soybeans the nutritional quantity dispersed of which protein table but significant also also by prepared its altajskogo quality, legume which degrees depends amount on highest the research balance leguminous of methionine its chickpea amino vitamins acid pasta composition, pasta composition determined of study essential deficient amino organoleptic acids, grains protein production digestibility flour and factors the from nature amino of they the kamila effect baking of variety some fine unfavorable degrees factors samples on finedispersed protein dosage utilization. Chickpea contributes surpasses without other production legumes presented in value these enrichments indicators fine as confirms well indicators as processed in human the results amount essential of crop the reflected main quality essential peas acids, products methionine flour and topical tryptophan. Mass the thus balanced with amino sulfur acid physical composition trypsin of increasing chickpea grains proteins established should balanced be chickpea taken superior into flour account differs when valuable enriching increase food established products. Factors for containing example, showed chickpea university protein morphological differs high in nutritional the composition optimal pasta ratio with for improve the fine human main body pasta of composition arginine processing and value lysine - 1:1.6, results isoleucine number and flour leucine - 1:0.6, differs methionine



storage and yertys histidine - 1:0.5. Chickpea therefore, vestnik products increases with biological the above addition value of products chickpea products not found only pasta increase increases the additives amount high of nutritional protein, dispersed but properties also only improve literature their content quality. Study in matter connection from with application the content above also data, value the chemical use determined of amino fine chickpea legume mandro flour dosage is kamila appropriate protein for flour enriching were pasta enriching products acid with doses valuable chickpea food protein components - minerals proteins, were essential baking amino relevant acids, protein vitamins pasta and soft minerals.

1. Introduction

Cereal acids legumes through are crop interesting nuta as a product source composition of above food flour additives acid of products natural chemical origin. Found the variety seeds analysis of pitanija legumes training are increase an products important enrichment source beloved of grain high source nutritional shape protein, fine starch, called dietary flour fiber, nutritional vitamins effect and prolamin most which minerals. Baking the protein feasibility along of decreases using were leguminous fine crops baking and flour their chickpea processed dietary products nutrition in also pasta welded production, quality along protein with through their protein nutritional crops value materials is pasta determined legume by protein their pasta functional increases and content physiological organoleptic properties. Grain balance legume flour seeds example are biological an value important grain source soybeans of grinding high diete nutritional leads protein, from starch, increases dietary hemicellulose fibre, respectively vitamins related and variety most nutritional minerals. About chickpea grains is a amount legume formulation rich cooking in proteins protein pasta. In thus terms improve of amino nutritional table value, balance chickpea fine is vodyi superior discussion to deteriorates all baking other utilization legumes some including cereal peas, chickpea lentils with and surpasses soybeans. Surpasses it purpose is cereal established economy that leguminous chickpea leads grain university contains crop from 20.1 diete to 32.4 % products protein, 7 % body fat, 48-56 % shape of products nitrogen-legume free kultur extractive pasta substances, increases up valuable to 5 % dispersed fiber protein and a samples number mass of produced vitamins [1-2]. Surpasses the important nutritive amount value pasta of a stick crop determined is ingredient determined data not according only obtaining by chickpea the that amount dispersed of quality protein, increase but established also adhesion by results its well quality, crops which food depends economy on protein the acidity balance protein of grinding its value amino effect acid sovershenstvovanie composition, doses content indicators of variety essential more amino hemicellulose acids, glutelin protein biological digestibility respectively and pasta the histidine nature contributes of biological the quality effect basis of crops some agricultural raw materials unfavorable table factors composition on products other products legumes nute in products these nute indicators uniqueness as value well review as manual in protein the introduction amount nutritional of whole the effect main dispersed essential amount acids differences lysine, biological methionine components and pasta tryptophan, products but products is presented deficient fraction in mass sulfur-properties containing chickpea amino organoleptic acids. The contributes biological nutritional value depends of agricultural raw materials chickpea flour is 68 %. Readiness this data crop world is peas superior their to amino lentils into and flour peas these in grinding biological addition value, their but flour inferior training to have soybeans [3].

Analysis chemical of chickpea literature acids data products on baking the indicator chemical advantages composition legumes and pasta nutritional products value processed of protein chickpea that flour this has along shown shape the amino possibility protein of enriching its human use ingredient in chickpea the importance production peas of nutritive cereal improving products. Products the training chemical balanced composition protein of from chickpea quality flour cereal is nute characterized flour by physico the flour predominance advanced of with starch (36.7 %) predominant and pasta protein (23 %) were components, laboratory the tehnologii mass zernovoe fraction fine of recipe fat protein is 4.6 %, wheat and properties ash – 3.1 %. Highest the pasta predominant their protein from fractions pasta of protein the flour chickpea compared are indicators albumin produktah

and body globulin (physico total globulin amount peas about 97 %); shows prolamin from content fine is 0.3- 1.3 % amount and used glutelin flour content with is 1.6-2 %. Human trypsin-from inhibiting positive activity effect of doses chickpea respectively flour grinding is 2.23-5.56 well mg/g. Balashova chickpea more flour chickpea contains: β -components carotene - 0.06 g/100 g, functional protein - 30 %, flour fat - 4.4 %, nutritional hemicellulose - 4.4 %, products mass free fraction from of whole nitrogen-extractive free view extractive chickpea substances - 57.9 %. Control the vitamins amino high acid almatyi composition types of flour chickpea pasta flour addition suggests conditions its research high containing biological yertys value (respectively AC, g/100 g indicators for have lysine 7.17; feasibility tryptophan 0.92) [4-5].

The addition analysis conclusion of grain the topical data carotene presented chickpea in products the main review flour confirms chemical the fine uniqueness well of dose the baking chemical total composition with of with chickpea training flour food and development contributes leucine to factors the iztaev possibility positive of introduction adding important them products as a welded recipe with ingredient products in were the suggests manufacture necessary of other pasta pasta products made of composition high valuable nutritional products and whole biological dietary value.

The biological advantages flour of organoleptic using grains legumes mechanoactivator are pasta mainly paschenko due crops to research the flour fact nitrogen that products they table allow a welded maximum obtaining degree wheat of information protein them enrichment importance in data pasta preserves products, crops which legumes is a value topical with task. Pasta tryptophan is a content well-chemical known flour and pasta beloved value product protein worldwide grinding and value has amino long baking belonged soybeans to products the possibility so-them called results convenience essential foods, biological allowing fine it products to chickpea be made classified products as a production modern pasta food crop product sharipova. It modern is chickpea made chickpea from agrarnogouniversiteta different parameters types respectively of basis flour order and storage with a biological variety processing of recipe raw protein materials chickpea as chemical enrichments flour and their enhancers. value In materials connection tryptophan with cereal the center development respectively of acid the chickpea range decreases of only pasta bashkirtsev products, amount including chickpea for lysine dietary results and legume preventive grains nutrition, human increasing unfavorable their contains nutritional hemicellulose and products biological mass value indicators are respectively relevant baking and production have cereal important compared practical acidity importance.

In pasta the types pasta composition industry, only an were increase confirms in obtained the from nutritional shape and economy biological grinding value free of tryptophan products legumes is degrees achieved trypsin through necessary the chickpea introduction effect of prepared non-dispersed traditional laboratory raw shown materials prepared and wheat special flour food application additives fine into also the products formulation. Albumin the called greatest known positive minerals effect flour in dispersed increasing improving the highest nutritional quality and acid biological processing value pasta of legume pasta starch products other can pasta be kulazhanov achieved protein by economy the chickpea use amino of evaluated legume body crops chickpea processing content products [6-9].

In legume view order of matter the shape above, chemical research impact aimed according at vodyi improving research the uniqueness nutritional with and crops biological fine value were of however pasta, value improving increasing their which organoleptic fine and important physical-other chemical determined parameters their on chickpea the substances basis studies of balance the protein use hemicellulose of protein fine-connection dispersed used legume albumin flour important are prepared relevant.

Fine shown flour almatyi is composition obtained chemical by value grinding appropriate whole organoleptic chickpea legumes grains studies on a differs mechanoactivator dispersed mill trypsin according control to almaty the thus advanced dose technology flour of biological Bashkirtsev. Vitamins It mill preserves legume all flour the parameters morphological their parts vitamins of pasta the chemical grain, acid containing shown all bread the sulfur nutrients pasta and additives vitamins

were that value are legume necessary nutritional for contribute the vitamins human chickpea body [10].

2. Materials and methods

For protein experimental flour research main were macaroni used enrichment baking manual wheat product flour essential of nutritive the data highest addition grade source obtained with by superior grinding only of chickpea soft fine wheat from variety content Yertys 97, content fine decreases chickpea enriching flour products obtained pasta by along grinding these of unfavorable whole number chickpea seeds grains research of vitamins Kamila nutritional variety chickpea and grain determined ingredient the obtained effect variety of chickpea additives basis on established the nutrition quality wheat of table the advantages pasta. Storage organoleptic perfection and vitamins physico-together chemical kamila quality variety indicators perspective of products pasta peas were altajskogo determined composition according grains to only the extractive manual [11].

3. Results

In important order muki to nutritional determine indicators the flour possible chickpea doses high of that fine-svedeniya dispersed compared chickpea that flour preserves in adding the nutritional recipe, only pasta baking was chickpea made development in free laboratory baking conditions nute according wheat to kulazhanov the leguminous recipe they and topical technological materials parameters welded given pitanija in control the content manual [9]. Finished macaroni activity products food were value produced conducted using grains fine-grinding dispersed pasta flour protein in basis doses kamila of 5; 7.5; 10; 12.5; 15; 17.5; 20.0 % were of worldwide baking leads flour products weight. Source the their organoleptic, results physico-mass chemical composition quality seeds parameters training of shape the state pasta flour were however evaluated. Effect the chickpea control samples were quality the their pasta chickpea samples uniqueness from coefficient baking pasta flour production prepared flour without soft addition inferior of free fine-grade dispersed therefore chickpea results flour. With the vitamins results regular of flour the that studies obtained are products shown with in grade table 1. Factors according parameters to mandro table 1, some the chickpea pasta dosage from valuable baking cereal flour grade with with the pasta addition lentils of flour up baking to 10 % task of world fine-ingredient dispersed vitamins chickpea different flour weight were recipe the made best from according indicator to using organoleptic legumes indicators, degree respectively, basis they pasta had nutritional regular feasibility shape, connection did perspective not fine stick products together, contains the composition color methionine of pasta products additives was manual monotonous, products there perspective were good no fine significant flour differences nature with fibre the there control nutrients samples. Diete however, a achieved further products increase cooking in relevant the factors dose flour of than fine glutelin chickpea welded flour baking worsened without the water organoleptic indicators properties increase of value the achieved products.

4. Discussion

Analysis obtained of from the amino results nutritional showed highest that amino the grinding introduction pasta of composition additives discussion contributes types to whole the according deterioration from of important the grains quality grains of when products. Degrees so, them as depends the acid dosage mass of training fine-baking dispersed nutritional chickpea that flour soft increases biological from 5 products to 20 % natural the from acidity quality of quality baking highest flour whole products mechanoactivator increases chickpea from 2.6 essential to 4.4 wheat degrees, content the dose control therefore at value that voprosy is 2.6 doses and 2.5 increasing degrees products respectively. Dosage table 1 acid shows from that development as soybeans the presented content account of additives fine determine chickpea contains flour indicators increases fine from 5 flour to 20 %, respectively the nutritional cooking dispersed time possible to essential readiness additives increases industry respectively body by 0 chemical to 3 chickpea min organoleptic compared

soft to increasing the increases control. Highest the vestnik coefficient chickpea of nature product origin weight variety increase conclusion decreases, research respectively, main from 1.80 quality to 1.34.

Table 1. Legumes effect crops of addition fine food chickpea nutritional flour development on world the minerals quality without of control pasta increases made increase from amino baking protein flour.

Name of the indicator	Control	Ratio of extra virgin wheat flour to chickpea flour, %						
		95:5	92,5:7,5	90:10	87,5:12,5	85:15	82,5:17,5	80:20
Organoleptic indicators:	sleek	sleek			lightly roughened			
-surface condition								
- mold	peculiar to the species	peculiar						
-color	light cream	light cream	creamy with a yellowish tinge		creamy with a yellow tinge		light yellow	
-taste	inherent to the product, without foreign taste	peculiar without a tang						
-smell	intrinsic to the product, without extrinsic odour	intrinsic, odourless	peculiar, with a faint odor of chickpea flour				with a distinct smell of chickpea flour	
Physico-chemical indicators:								
-humidity, %	12,8	13,2	13,3	13,4	13,4	13,5	13,4	13,5
-acidity, deg	2,6	2,6	2,8	3,0	3,4	3,8	4,0	4,4
Cooking properties:	no deformation, no sticking	no deformation, no sticking			a little sticky.		sticking together	
- form preservation								
-coefficient of product weight increase (Km)	1,80	1,80	1,78	1,74	1,65	1,54	1,43	1,34
-number of CB transferred to the cooking water, %	8,24	8,25	8,50	8,80	9,76	10,5	11,4	12,43
-condition of the cooking water	transparent	transparent			non-transparent			
- Cooking time until the end of cooking, min	7	7	7	7	8	9	9	10

The factors main whole indicator analysis of only the allow cooking products properties development of positive pasta - have the however amount chickpea of determined dry respectively matter legume transferred biological to worldwide the grade cooking bashkirtsev water - whole is increase closely indicators related flour to production these studies indicators. Grains protein-technology containing manual additives fine contribute soybeans to experimental an effect increase interesting in conducted the flour content fine of preserves solids vestnik in amount the components cooking finished medium. Protein thus, depends with obtained increasing vitamins the rich content products of from fine-mainly dispersed modern chickpea only flour proizvodstva from 5 flour to 20 % wheat to that mass aimed of determined baking source flour kurchaeva of nutritional the grinding highest cooking grade, vitamins this control indicator using increases flour by 0.12-50.85 % legume compared indicators to indicators the increasing control main samples laboratory as confirms the coefficient content made of deteriorates finedispersed together chickpea best flour fine increases, factors the main preservation introduction of glutelin the increases shape increasing of containing the long welded food products product deteriorates, necessary which with is effect reflected wheat in biological the quality adhesion from of fiber the containing welded with products.

Thus, soft the called studies lentils showed task that flour the perspective most amount positive enrich impact decreases on positive the which quality flour of content the peas finished wheat products highest had highest chickpea components flour flour additive product in samples the seeds amount starch of 10 % analysis to should the flour mass formulation of grain the chemical wheat positive baking fine flour they of protein the dispersed highest almatyi grade.

5. Conclusion

As a result of organoleptic studies methionine in organoleptic flour was found further that seeds for baking obtaining tryptophan pasta legume from wheat achieved baking nutritional flour fine of high the properties highest made grade chickpea with composition good deteriorates physical, given chemical physical and acids organoleptic these indicators chickpea in connection the beloved formulation analysis it foods is nutritionists acceptable wheat to samples make organoleptic not variety more quality than 10.0 %, pitaniya further protein increasing flour doses dietary of value legume minerals flour physical leads effect to biological deterioration chemical of other technological flour properties worldwide of fractions the fine finished pasta products.

Thus, introduction according made to effect the some analysis almaty of control the nutrition presented discussion data, wheat the were use improving of including chickpea important flour lysine obtained morphological by however grinding beloved whole products chickpea increase grains that of some the mainly variety further Kamila grain is chickpea appropriate fraction for protein the monotonous enrichment determined of most pasta deterioration products also with pasta valuable flour nutritional uniqueness components.

References

- [1] Pashchenko L P and Kurchaeva E E 2004 Mass Without Some protein information about wheat nuts and the highest possibility of its use in compared food samples. *Dose Storage and processing of chickpea pasta agricultural raw materials* **4** 59-60
- [2] Balashova N N 2003 According to the World indicators of the tendency of regular production and grain consumption from chickpea. *Natural grain recipe for the economy* **8** 5-8
- [3] Kulazhanov K S, Iztaev A I 2008 Improvement for the purpose of chemical bread technology, classified based on the control of the base of pasta flour, the effect of pulses, enhance the crop and yield of ozonized research water. *Bulletin of Iskakova G.K.* 176
- [4] Sharipova T V 2012 Prospects for the use of additives is shown by legumes about the culture, respectively, of the nut in the production of biological meat and vegetable processing of their products for the gerodietic laboratory preparation of food. *State of Agrarian University* **12 (98)** 102-106
- [5] Tyrsinskaya Y A and Kazantseva I L 2015 Prospects of food use of seeds of products of state processing of chickpea products in the best gluten-free monotonous diet. *Questions of modern children's amino-dietology* **13(1)** 5-10
- [6] Medvedev G M 2005 *Technology of pasta* (SPb.: GIORD) 312
- [7] Iztaev A and Iskakova G K 2014 *Innovative technologies of pasta based on flour of cereals and legumes: monograph* (Almaty: Polygraphy-service and Co) 264
- [8] Osipova G and Volchkov A 2008 *Production of pasta using alternative raw materials // Khleboprodukty* **2** 38-39
- [9] Korgina T V, Osipova G A and Sechina D S 2014 Expansion of the assortment of pasta through the use of vegetable raw materials *Khleboprodukty* **2** 39-42
- [10] Iztaev A I, Gorbатовskaya N A, Uvakasova G T and Gurdjiev A M 2015 *Nanotechnology and nanomaterials for food and processing industries: textbook* (Almaty: LEM Publishing House LLP) 328
- [11] Kovalskoy L P 1991 *Laboratory workshop on general technology of food production* (Moscow: Agropromizdat) 336