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Influence of foliar feeding of common wheat varieties on the nutritional value of the grain

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Abstract. . *Two years of polls from the field trials of the Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria were used for the purpose of the survey. In the period 2015-2016, two varieties of common wheat (Apolon and Bolonga), treated by leaf liquid fertilizers, imported alone and in combinations were tested under field conditions. Main fertilization with ammonium nitrate was done. The variants of the experiments were as follows: 1) Without fertilization (Control); 2) Ammonium nitrate (N_{140}); 3) Lactifrost – l0.0 L/ha; 4) Lactifros + Lactofol base – 10.0 L/ha + 5.0 L/ha; 5) Lactofol base – 5.0 L/ha; 6) Wuxal Grano – 4.0 L/ha; 7) Wuxal Grano – 4.0 L/ha + 2.0 L/ha. It was found that crude protein content ranged from 136.90 to 144.63g/kg DM in the Apolon variety and from 129.98 to 145.12 g/kg DM in the Bologna variety. An increase in CP content was seen as a result of feeding with Lactifrost and Lactofol base, respectively, by 5.6% and 11.7% relative to the control. Treatment of common wheat with liquid leaf fertilizers, however, does not lead to improvements in energy (metabolizable energy, digestible energy, feed unit for milk, feed unit for growth) and protein digestible in (small) intestine nutrition. In both varieties there were many positive and negative correlations between the investigated parameters: CP, CFAT, CF, DEE, FUM, FUG, PDI, Dep, MEp, DEpg and MEpg; in ruminants the same positive correlations for both varieties are between CP and PDI ($p<0.01$) and negative - between CP and FUM ($p<0.05$), and between CFAT and PDI ($p<0.05$); in nonruminants negative correlations exist between CF and the energy values (DEp, MEp, DEpg and MEpg) only in Apolon variety.*

Keywords: common wheat, leaf fertilizers, energy digestibility, protein digestibility, digestible energy

Abbreviations:

CF – crude fibre, CFAT - crude fats, CP – crude protein, DCF - digestible crude fibre, DE – digestible energy, DEp – digestible energy for poultry, DEpg - digestible energy for pigs, DEE – digestible ether extract, Deg – degradability of dietary protein in the rumen, DM – dry matter, DNFE – digestible nitrogen free extract, DOM – digestible organic matter, DP – digestible protein, EE – ether extract, FOM – fermentable organic matter, FP – silage fermentable products, FUG - feed unit for growth, FUM - feed unit for milk, GE – gross energy, ME – metabolizable energy, MEp – metabolizable energy for poultry, MEpg - metabolizable energy for pigs, NFE - nitrogen free extract, PDI - protein digestible in (small) intestine.

Introduction

Wheat is one of the traditional and economically important crops for many regions of the world. Protein is a major quantitative factor that determines the quality of wheat grain. In this connection, it is of particular importance to study the elements of agrotechnics that influence the levels of raw protein and the nutritional value of the grain. Increasing raw protein content in the grain is a topical issue in the world about nutrition. The different diets, according to a study by Ivanova et al. (2006), lead to the emergence of specific varietal peculiarities regarding the ability of plants to digest nutrients throughout the vegetative course. Soil treatment is another component of the technology that, along with different levels of fertilization, influences the levels of crude protein in the grain. Mihailova et al. (2012) underlined that fertilization with $N_6P_5K_4$ increases the content of crude protein, raw fats and mineral substances. The feed rates tested did not significantly alter the crude fibre, crude fats, metabolizable energy and digestible ether extract content.

The main agrotechnical factor for the formation of the biological and economic characteristics of 14 kinds of winter common wheat are the weather conditions of the year, and for the quantity of grain yield is the norm of the mineral fertilization, considers Ivanova et al. (2009). Nankova et al. (2004) stated that optimization of wheat feed can be achieved by applying foliar feed during vegetation and reducing basic fertilization. Balanced fertilization provides high yields and quality production, but the application of extra-cranium nourishing in crops is the subject of a study of many researchers demonstrating its effectiveness (Kolev et al., 2004, 2011; Gramatikov et al., 2006; Brzozowska et al. 2008; Pachev, 2012; Hristov, 2014). This necessitates the continuation of these studies on crops traditional to our agriculture.

The purpose of this study was to evaluate the effect of extra-corn feeding in common wheat varieties on the chemical composition and nutrient value of the grain. Using a correlation analysis, the chemical composition and the nutritional value of wheat for ruminants and non-ruminants were determined.

Material and methods

For the purpose of the study, two-year data from field experiments, drawn from the experimental field of the Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, were used. The experiment was carried out on a meadow-tin reed. The trials are staked on three fractions. In the period 2015-2016, two varieties of common wheat (Apolon and Bolonga), leaf liquid fertilizers

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(Laktifrost, Laktofol base and Wuxal Grano), imported alone and in combinations, were tested in the field experiment.

Lactifrost and Lactofol base are the main Bulgarian fertilizers used for the foliar feeding of the crops produced by Ecofol SC. Lactifrost is a specialized leaf fertilizer that is applied at the first signs of spring vegetation. It helps to improve the root system and activates the growth of young plants as well as to better absorb nitrogen fertilizers. Lactofol base is a leaf fertilizer containing vitamins, physiologically active substances and natural binders (Table 1).

Table 1. Content of macro and micro elements in leaf fertilizers

Foliar fertilizers	g/L					mg/L				
	N	P_2O_5	K_2O	SO_3	MgO	B	Cu	Mn	Mo	Zn
Lactofol base	101.0	29.4	50.9	1.36		305	203	226	23	452
Lactifrost	13.8	42.4	37.9	2.12		477	106	106	2120	64
Wuxal Grano	219.0			365.00	29		0.0043	0.0043		0.0146

Wuxal Grano is a liquid suspension produced by Syngenta. It is a concentrated and effective formula enriched with sulfur and other trace elements. The manure contains microelements in chelated form, which contribute to balanced fertilization of the crop.

Liquid fertilizers are used for extra-corn feeding of common wheat during vegetation. The main fertilization with ammonium nitrate was carried out for control. The variants of the study are as follows: 1) Without fertilization (Control); 2). Ammonium nitrate (N_{140}); 3) Lactifrost – l0.0 L/ha; 4) Lactifrost + Lactofol base – 10.0 L/ha + 5.0 L/ha; 5) Lactofol base – 5.0 L/ha; 6) Wuxal Grano – 4.0 L/ha; 7) Wuxal Grano – 4.0 L/ha + 2.0 L/ha.

The experiment included two varieties of common wheat Apolon and the introduced Bologna variety. After harvesting, a chemical analysis of the Weende method was performed. Crude protein, crude fibre, crude fats, digestible ether extract and mineral substances were determined. The technology of displaying the field study is standard for the area other than the appended embodiments of fertilization and feeding of common wheat.

The contents of feed unit for growth, feed unit for milk and protein digestible in (small) intestine (PDI) in ruminants were calculated using the formulations of Todorov et al. (2004, 2007):

GE = 0.0242 CP + 0.0366 EE + 0.0209 CF + 0.017 NFE;
ME = 0.0152 DP + 0.0342 DEE + 0.0128 DCF + 0.0159 DNFE;
FUM = ME (0.075 + 0.039q), q = ME/GE;
FUG = ME (0.04 + 0.1q);
PDI = 1.11CP (1 - Deg) Dsi + 0.093 FOM;
FOM = DOM - DEE - FP - CP (1 - Deg);
FP = 250 - 0.5 DM.

DE and ME values for pigs and poultry were calculated using the equations (Todorov et al., 2004):

DEpg = 0.0242 DP + 0.0394 DEE+0.0184 DCF + 0.0170 DNFE;
MEpg = 0.0210 DP + 0.0374 DEE+0.0144 DCF + 0.0171 DNFE;
DEp = 0.0239 DP + 0.0398 DEE+0.0177 DCF + 0.0177 DNFE;
MEp = 0.0178 DP + 0.0397 DEE+0.0177 DCF + 0.0177 DNFE.

The impact assessment of the tested leaf fertilizers on common wheat varieties Apolon and Bolonga is based on the following indicators: CP, CF, CFAT, DEE in wheat and the calculated FUG, FUM, PDI, ME and DE.

A correlation analysis was carried out, which established and evaluated the correlations between the investigated indicators expressed by the correlation coefficient ®, calculated with statistical program SPSS 13. The correlation dependencies are derived as a result of the mathematical and statistical processing of Genchev et al. (1975) output data.

Results and discussion

The protein content of feed is of utmost importance for their nutritional value. The results of the chemical analysis of the grain of the two varieties show a narrow variation in the content of both crude protein and the other components of wheat under the influence of the applied liquid fertilizers. In Apolon variety, the crude protein content ranges from 136.90 g/kg DM in the untreated control to 144.63 g/kg DM in the case of the combined fertilization of Lactifrost and Lactofol base (Table 2). An increase of 5.6% indicates the influence of leaf fertilizers imported during braking and through phenophase of wheat. In Bologna variety, an increase in crude protein levels was also observed, while the highest (145.12 g/kg DM) was recorded at the treatment with Lactifrost and Lactofol base. Compared to the net control, the increase is 11.7%.

The crude fiber content of Apolon ranges from 15.94 to 19.65 g/kg DM. In Bologna, the crude fiber content is lower and ranges between 11.95 and16.29 g/kg DM. Higher level of crude fibre reduce the digestibility and nutritional value of the feeds.

In the case of ruminants, two units of energy nutrition assessment are used: feed unit for growth, feed unit for milk. Protein feed is determined by the protein digestible in (small) intestine.

After the treatment and analysis, the variance of the studied parameters was determined under the influence of the fertilizer introduced during the vegetation. The data show a slight variation in the values of FUG and FUM for both wheat varieties. For PDI, too, a narrow movement of 102.30-104.37 g/kg DM in Apolon and 102.01-104.62 g/kg DM in Bologna were again established. Slight variation indicates that fertilization through liquid leaf fertilizer does not contribute to increased nutritional value (Table 3).

Table 2. Energy and protein value of wheat for ruminants (кg/DM)

Variety		CP	CFAT	CF	DEE	FUM	FUG	PDI
Apolon	1	136.90	20.32	16.96	808.30	1.47	1.63	102.98
	2	136.96	26.67	19.55	798.53	1.47	1.63	102.30
	3	137.43	20.40	15.94	808.70	1.47	1.64	103.08
	4	144.63	16.99	17.53	803.03	1.46	1.62	104.37
	5	138.44	20.70	19.65	801.61	1.46	1.63	102.92
	6	138.48	21.84	16.65	807.78	1.47	1.64	103.29
	7	142.12	21.52	19.02	800.48	1.46	1.63	103.65
Bologna	1	129.98	22.73	13.29	818.26	1.48	1.66	102.01
	2	132.58	22.09	13.78	816.35	1.48	1.65	102.48
	3	140.22	22.31	12.77	808.86	1.47	1.64	103.57
	4	145.12	18.84	11.95	808.30	1.47	1.63	104.62
	5	135.88	22.22	16.29	813.14	1.48	1.65	103.12
	6	137.89	23.29	13.59	811.05	1.48	1.65	103.26
	7	140.63	20.78	14.74	809.25	1.47	1.64	103.81

*CP - crude protein, CF - crude fibre, CFAT - crude fats, DEE - digestible ether extract, FUM - feed unit for milk, FUG - feed unit for growth, PDI - protein digestible in (small) intestine

Table 3. Energy and protein value of wheat for pigs and poultry (кg/DM)

Variety		CP	CFAT	CF	DEE	DEp	MEp	DEpg	MEpg
Apolon	1	136.90	20.32	16.96	808.30	15.87	15.20	16.47	16.15
	2	136.96	26.67	19.55	798.53	15.88	15.21	16.50	16.17
	3	137.43	20.40	15.94	808.70	15.89	15.22	16.49	16.16
	4	144.63	16.99	17.53	803.03	15.86	15.15	16.46	16.12
	5	138.44	20.70	19.65	801.61	15.81	15.13	16.42	16.09
	6	138.48	21.84	16.65	807.78	15.93	15.25	16.54	16.21
	7	142.12	21.52	19.02	800.48	15.88	15.19	16.49	16.16
Bologna	1	129.98	22.73	13.29	818.26	15.95	15.31	16.54	16.24
	2	132.58	22.09	13.78	816.35	15.95	15.30	16.55	16.24
	3	140.22	22.31	12.77	808.86	15.98	15.30	16.59	16.25
	4	145.12	18.84	11.95	808.30	15.98	15.27	16.58	16.24
	5	135.88	22.22	16.29	813.14	15.97	15.31	16.58	16.26
	6	137.89	23.29	13.59	811.05	16.00	15.32	16.60	16.28
	7	140.63	20.78	14.74	809.25	15.96	15.28	16.57	16.23

*CP - crude protein, CF - crude fibre, CFAT - crude fats, DEE - digestible ether extract, DEp – digestible energy for poultry, MEp –metabolizable energy for poultry, DEpg - digestible energy for pigs, MEpg - metabolizable energy for pigs

In pigs and poultry, two parameters - digestible energy (DE) and metabolizable energy (ME) are also used as indicators of energy consumption. When calculating the digestible and exchangeable energy again, the slight variation of the values obtained is again impressed. The digestible energy values of pigs range from 16.42 to 16.54 g/kg DM for Apolon and 16.54 to 16.60 g/kg DM for Bologna, and for the exchange energy from 16.09 to 16.28 g/kg DM for both varieties (Table 3).

Values of computed digestible energy in birds are lower than in pigs. The ranges of variation are narrow and are within 15.81-16.00 g/kg DM in both studied varieties. This tendency is also maintained at the exchange energy – 15.13-15.32 g/kg DM.

As a result of the correlation analysis some correlations were established. In ruminants negative correlations between CP and FUM were found (r = -0.775, p<0.05 and -0.822, p<0.05) and between CP and FUG (r = -0.653 and -0.953, p<0.01), respectively, in both varieties (Table 4 and 5). The correlations between DEE and FUM and FUG contents are positive, and they are higher and statistically proven in the Bologna variety (r= 0.808, p<0.05 and 0.879, p<0.01) compared to Apolon variety (r = 0.530 and 0.545). A relatively high correlation dependence was observed between CRAF and FUM (r = 0.694) and FUG (r= 0.852, p<0.05) in the Bologna variety. Positive is the correlation between the CP and PDI content in both varieties (r= 0.915, p<0.01 and r= 0.994, p<0.01, respectively). The established relationships between the investigated parameters can serve to predict the productivity of the wheat varieties and the benefits of each of them.

In nonruminants, the higher CF content of Apolon variety than in Bologna variety also determines the negative correlations between CF and the energy values (DEp, MEp, DEpg and MEpg) (Table 6). The correlation analysis of the studied common wheat varieties revealed a very high correlation (r= 0.957, p<0.01) between the CRAF and MEp in Bologna variety, while in Apolon variety this dependence is low and statistically unproven (Tables 6 and 7).

Table 4. Correlations between chemical composition and energy and protein value of Apolon variety in ruminants

	CP	CFAT	CF	DEE	FUM	FUG	PDI
CP	1.000	-0.603	0.104	-0.304	-0.775*	-0.653	0.915**
CFAT		1.000	0.450	-0.430	0.477	0.339	-0.822*
CF			1.000	-0.930**	-0.520	-0.458	-0.270
DEE				1.000	0.530	0.545	0.104
FUM					1.000	0.645	-0.605
FUG						1.000	-0.457
PDI							1.000

*p<0.05, **p< 0.01

Table 5. Correlations between chemical composition and energy and protein value of Bologna variety in ruminants

	CP	CFAT	CF	DEE	FUM	FUG	PDI
CP	1.000	-0.713	-0.326	-0.964**	-0.822*	-0.953**	0.994**
CFAT		1.000	0.336	0.525	0.694	0.825*	-0.762*
CF			1.000	0.221	0.412	0.388	-0.277
DEE				1.000	0.808*	0.879**	-0.940**
FUM					1.000	0.867*	-0.797*
FUG						1.000	-0.955**
PDI							1.000

*p<0.05, **p< 0.01

Table 6. Correlations between chemical composition and energy and protein value of Apolon variety in nonruminants

	CP	CFAT	CF	DEE	DEp	MEp	DEpg	MEpg
CP	1.000	-0.603	0.104	-0.304	-0.130	-0.462	-0.178	-0.288
CFAT		1.000	0.450	-0.430	0.245	0.441	0.414	0.455
CF			1.000	-0.930**	-0.581	-0.542	-0.415	-0.422
DEE				1.000	0.425	0.470	0.268	0.317
DEp					1.000	0.936**	-0.979**	0.969**
MEp						1.000	0.935**	0.966**
DEpg							1.000	0.988**
MEpg								1.000

*p<0.05, **p< 0.01

Table 7. Correlations between chemical composition and energy and protein value of Bologna variety in nonruminants

	CP	CFAT	CF	DEE	DEp	MEp	DEpg	MEpg
CP	1.000	-0.713	-0.326	-0.964**	0.590	-0.685	0.683	-0.037
CFAT		1.000	0.336	0.525	0.037	0.957**	-0.017	0.574
CF			1.000	0.221	-0.220	0.348	-0.024	0.165
DEE				1.000	-0.659	0.537	-0.790*	-0.075
DEp					1.000	0.154	0.939**	0.762*
MEp						1.000	0.057	0.721
DEpg							1.000	0.664
MEpg								1.000

*p<0.05, **p< 0.01

Conclusion

Based on results of the conducted study it was found that: a) crude protein content ranged from 136.90 to 144.63 g/kg DM in the Apolon variety and 129.98 to 145.12 g/kg DM in the Bologna variety; b) as a result of lactate feed and Lactofol base crude protein content increased in the two varieties by 5.6% and 11.7%, respectively; c) the feed formulations used for leaf fertilization do not affect the digestible and exchangeable energy content of both wheat varieties; d) no significant impact of liquid leaf fertilization treatment on the nutritional value of wheat in ruminants (FUM, FUG and PDI); e) in both varieties there were many positive and negative correlations between the investigated parameters: CP, CFAT, CF, DEE, FUM, FUG, PDI, Dep, MEp, DEpg and MEpg; in ruminants the same positive correlations for both varieties are between CP and PDI ($p<0.01$) and negative - between CP and FUM ($p<0.05$), and between CFAT and PDI ($p<0.05$); in nonruminants negative correlations exist between CF and the energy values (DEp, MEp, DEpg and MEpg) only in Apolon variety.

References

Brzozowska I, 2008. Macroelement content in winter wheat grain as affected by cultivation and nitrogen application methods. Acta Agrophysica, 11, 23-32.

Barov V, 1982. Analysis and schemes of field experience. NAPS, Sofia (Bg).

Gramatikov B and Koteva V, 2006. Effect of humus on the productivity of some field crops. Field Crops Studies, III, 413-419.

Genchev G, Marinkov E, Yovcheva V and Ognianova A, 1975. Biometric methods in plant breeding, genetics and selection. Publishing House Zemizdat, Sofia (Bg).

Ivanova A, Nankova M and Cenov H, 2006. Influence of variety and fertilization on macroelements utilization in *T. aestivum* L. in the vegetation period. Field Crops Studies, III-1, 137-145.

Ivanova A and Tzenov N, 2009. Biological and economic signs of common wheat varieties according to growing conditions. Field Crops Studies, V, 173-182.

Ivanova I, Ilchovska M and Ilchovska D, 2014. Investigation of the correlation dependence between important agronomic indicators in mutant maize hybrids and their grouping by factor analysis. In: Proceedings of National Scientific conference with international participation - Ecology and Health, Plovdiv, pp. 93-97.

Hristov I, 2014. Effect of the foliar feeding applying on the grain yield of triticale and barley growing in rotation. Science & Technologies, Plant studies, IV, 105-108.

Kolev T, Todorov J and Koleva L, 2011. Test of foliar fertilizers in triticale. Plant Breeding Sciences, 48, 495-498.

Kolev T and Gorbanov S, 2004. Influence of extra-corrosion fertilizers on the development and productivity of durum wheat. Plant Growth Sciences, 37, 480-484.

Mihaylova M, Basitov R, Basitov V and Ganev G, 2012. Influence of soil treatment and fertilization on the nutritional value of the grain from a feedbrush for non-ruminants. Science and Technologies. Animal Studies and Veterinary Medicine, I, 54-59.

Nankova M, Ivanova A and Penchev E, 2004. Characterization of liquid K-humate lombriosporum and possibilities for its use during the vegetation of *T. Aestivum* L. Field Crops Studies, I, 292-299.

Pachev I, 2012. Study of the influence of MaxGrow universal slurry on the yield of seeds in spring fodder peas (*Pisum sativum* L.). Soil Science Agrochemistry and Ecology, 2, 63-67.

Todorov N, Ilchev A, Georgieva V, Girginov D, Djouvinov D, Penkov D and Shindarska Z, 2004. Animal nutrition, Textbook, UNISCORP, Sofia, pp. 312 (Bg).

Todorov N, Krachunov I, Djouvinov D and Alexandrov A, 2007. Handbook of Animal Feeding, Matkom, Sofia, pp. 400 (Bg).

Veselinov E, Elenkov E, Karaivanov V, Popova D, Todorov J and Kumanov B, 1984. Pepper. Publishishing House Zemizdat, Sofia, p. 142 (Bg).

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Instruction for authors

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The manuscript should be structured as follows: Title, Names of authors and affiliation address, Abstract, List of keywords, Introduction, Material and methods,Results, Discussion, Conclusion, Acknowledgements (if any), References, Tables, Figures.

The title needs to be as concise and informative about the nature of research. It should be written with small letter /bold, 14/ without any abbreviations.

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Keywords: Up to maximum of 5 keywords should be selected not repeating the title but giving the essence of study.

The introduction must answer the following questions: What is known and what is new on the studied issue? What necessitated the research problem, described in the paper? What is your hypothesis and goal ?

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Results are presented in understandable tables and figures, accompanied by the statistical parameters needed for the evaluation. Data from tables and figures should not be repeated in the text. **Tables** should be as simple and as few as possible. Each table should have its own explanatory title and to be typed on a separate page. They should be outside the main body of the text and an indication should be given where it should be inserted.

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Discussion: The objective of this section is to indicate the scientific significance of the study. By comparing the results and conclusions of other scientists the contribution of the study for expanding or modifying existing knowledge is pointed out clearly and convincingly to the reader.

Conclusion: The most important consequences for the science and practice resulting from the conducted research should be summarized in a few sentences. The conclusions shouldn't be numbered and no new paragraphs be used. Contributions are the core of conclusions.

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Todorov N and Mitev J, 1995. Effect of level of feeding during dry period, and body condition score on reproductive performance in dairy cows,IXth International Conference on Production Diseases in Farm Animals, September 11–14, Berlin, Germany.

Thesis:

Hristova D, 2013. Investigation on genetic diversity in local sheep breeds using DNA markers. Thesis for PhD, Trakia University, Stara Zagora, Bulgaria, (Bg).

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