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THE PRODACTIVITY OF SILVER FOXES THROUGH PARTIAL SUBSTITUTION CORN MIDDLING FOR APPLE PULP AND PUMPKINS IN THEIR DIET

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The possibility of using apple pulp and pumpkins in the diet of marketable calves of silver foxes in order to save expensive grain feed has been carefully studied and experimentally proved.

The silver foxes, fur, quality, performance, live weight, morphology and biochemistry of blood, economic efficiency, feed pumpkin, apple pulp.

It is mentioned by home and foreign scientists that including 30% in calories of juice fodder crops into the feeding of fur animal in the period of fur growth assists the improvement of the quality of recommendations of products [7, 10, 14]. According to the recommendations of specialists, hydroponic greens, berries, sowing grass are the best juicy fodder of foxes living in the cages [1, 5, 8]. However not traditional juicy fodder crops are not worse the pointed ones neither by nutrition's ness not by the level of biologically active substances. But their productive influence on the body and the quality of fox fur is still remaining not fully investigated. That's why in science-house hold experiment the part of corn middling in the diet of silver foxes in the period of fur growth was replaced by apple pulp and ground feed pumpkins (tabl. 1).

1. The schema of the experiment

Groups	The number of animal	Peculiarities of feeding animals by periods	
		Preparatory, 30 days	Main, 122 days
1 – control group	10	Main ration (MR)	MR
2 – experimental group	10	MR	MR substation corn middling for apple pulp 4,45% in the diet or by 6,25% in the weight
3 – experimental group	10	MR	MR substation corn middling for apple pulp 8,90% in the diet or by 12,5% in the weight

4 – experimental group	10	MR	MR substation corn middling for apple pulp and pumpkins 4,45% in the diet or by 6,25% in the weight

The main of the experiment was to explore the productivity of marketable calves of silver foxes through the partial substation corn middling for apple pulp and pumpkins in their diet.

Material and the methods of the investigations. The experiment was conducted in the private enterprise of O.M. Bacun in the village of Slobidka Rachnivetska Dunaivetskyi district of Khmelnytskyi region during July-December in 2013. Animals, not divided by sex, had been chosen with the help of the analogy method and allocated into 4 groups with 10 heads in each one [6, 11, 16]. During the comparative period animals of experimental groups were gradually fed with apple pulp and pumpkins which replaced the part of stewed corn middling. At the beginning and the end of the experiment control weighing was help to define the average daily and absolute growth rate. At the end of the main period of the experiment the samples of blood were taken for morphology and biochemistry test of blood [4, 13]. Marketable calve were killed in the way of gas attack [12]. The skin was taken away like "stocking" and influenced by primary processing [17]. Unsalty-dry skins were evaluated according to the active framework [19]. Economic efficiency of the suggested method of increasing the productivity of the fur animals was defined by the generally accepted methodology [3].

Experiments' results. The analysis of live weight of the marketable calves of the control and experimental groups didn’t show changes. But at the end of the experiment the animals of the 2-nd and 4-th groups had more weight relatively 0,76 and 1,60%, absolute growth rate – by 2,50 and 1,50 % and the average daily – by 2,50 and 1,60% (tabl. 2).

It was experimentally established that the usage of about 160 g/day of apple pulp in the diet of foxes lead to making siftings not so thick and to the reduce the body weight growth by 0,08 kg during the period of the experiment and by 0,65 g during the day. By the about mentioned feeding changes had little effect on the

physiological state. All animal were clinical healthy and hematology indices were in the measure of acceptable levels [3].

2. Live indices of marketable calves of silver foxes, M±m, n=10

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
Live weight at the beginning of preparatory period, kg	4,46 ± 0,25	4,42 ± 0,29	4,40 ± 0,31	4,48 ± 0,30
Live weight at the beginning of main period, kg	4,99 ± 0,19	4,99 ± 0,22	4,99 ± 0,23	5,11 ± 0,23
Live weight at the end of the experiment, kg	6,96 ± 0,31	7,01 ± 0,33	6,88 ± 0,36	7,07 ± 0,35
Average daily growth rate, g	16,14± 1,73	16,55± 1,68	15,49± 1,57	16,39± 1,64
Absolute growth rate over the period of experiment	1,97 ± 0,21	2,02 ± 0,18	1,89 ± 0,19	2,00 ± 0,20

Investigation results of the level and the correlation separate form elements and the speed of subsidence foxes erythrocytes are given in table 3.

3. Blood morphology of marketable calves of silver foxes, M±m, n=4

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
The level of hemoglobin, g/l	125,00± 10,00	130,00± 11,55	135,00± 19,15	140,00± 23,09
The level of leukocytes, G/l	5,50 ± 0,41	5,38 ± 0,75	5,50 ± 0,41	5,38 ± 0,75
The level of erythrocytes, G/l	9,38 ± 0,48	9,50 ± 0,41	9,38 ± 0,48	9,75 ± 0,65
Colour index	1,11± 0,12	1,08± 0,07	1,03± 0,09	1,04± 0,11
ESR, mm/h.	2,75 ± 0,96	3,00 ± 0,82	2,75 ± 0,09	2,75 ± 0,96

The table material signifies that with increasing the part of apple pulp in the diet of marketable calves of foxes rises the concentration of hemoglobin in their blood and in the combination with feed pumpkin – associates increasing the level of erythrocytes by 3,9%.

Studying the leukocytes formula of the blood research animals of the 2-nd and the 4-th drops showed that the correlation of white cells almost didn't differ from the control indices. On the contrary, in the foxes that were fed by sittings with maximum quantity of apple pulp increases of the quantity of basophils by 0,5%, eosinophils by 1,5%, segmentonucleris neutrophils by 2,75 % and reduce of the level of band neutrophils by 1,5%, lymphocytes by 5,25%, monocytes by 0,5% were observed.

The shift left of neutrophils' nucleus was observed in these animals, but pathological changes were not detected, because indices had the proper level in measure of physiological norm [13].

The components of biochemical blood metabolism of the experimental animals from the control exponents. But the calcium concentration in increased by 3,7 and 8,1% in the animals of the 2-nd and the 4-th experimental groups, and in the foxes of the 3-th group – on the contrary, there was the lower level of calcium and inorganic phosphorus than in the control group (tabl. 4).

4. Biochemical indices of silver foxes at the end of the experiment, M±m, n=4

Index	Groups			
	1 – control group	2 – experimenta group	3 – experimenta group	4 – experimenta group
Calcium, umol/l	2,73 ± 0,26	2,83 ± 0,62	2,63 ± 0,25	2,95 ± 0,42
Phosphorus inorganic, umol/l	1,03 ± 0,11	1,11 ± 0,14	1,00 ± 0,04	1,10 ± 0,15
Glucose, umol/l	4,25 ± 0,65	3,63 ± 0,75	4,13 ± 0,75	3,88 ± 1,03
Cholesterol, umol/l	4,25 ± 0,49	3,93 ± 1,44	3,35 ± 0,51	3,80 ± 0,99
Total protein, g/l	60,00 ± 4,08	60,00 ± 7,07	63,75 ± 4,79	62,50 ± 8,66
Albumin, g/l	28,75 ± 2,50	30,50 ± 4,20	32,50 ± 2,89	28,75 ± 4,79
Globulins, g/l	31,25 ± 4,79	29,50 ± 4,93	31,25 ± 4,79	32,50 ± 5,00
A/G	0,94 ± 0,21	1,06 ± 0,24	1,07 ± 0,23	0,91 ± 0,24

From the material given in the table it is clear that in the animals of all experimental group the level of glucose and cholesterol in the blood was lower of the 1-st control group. The changes in the indices of protein metabolism of blood of marketable calves while implementing different quantity of apple pulp and feed

pumpkins were not the same. So, in the animals of the 2-nd experimental group the general level of protein in the blood serum didn't differ from the control group , but although the concentration of albumins increased by 6,1%, and globulins on the contrary, decreased by 5,6%. The animals of the 3-rd experimental group were characterized by increasing the quantity of protein in the blood by 3,75 g/l on the account of rising albumins level, and the 4-th group, on the contrary, on the account of the increasing the concentration of globulins in the blood by 1,25 g.

The analysis of blood enzyme activity of experimental animals showed that through including into their diet from 80 to 160 g of apple pulp per day there is the decrease of the concentration AlAT by 4,4 – 5,9% (tabl. 5).

5. The activity of separate blood enzyme of marketable calves of silver foxes, M±m, n=4

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
AlAT, IO/l	197,50± 13,23	185,75± 8,69	188,75± 16,54	197,50± 18,48
AsAT, IO/l	146,25±18,87	140,00±25,87	155,00±22,73	153,25±27,24
Acid phosphatase, IO/l	33,25 ± 2,06	34,25± 1,50	34,25 ± 0,96	37,75 ± 1,26
α – amylase, IO/l	625,00± 64,55	705,00± 75,94	670,00± 72,57	727,50± 73,65

Including apple pulp in the diet of marketable calves of foxes didn't condition the changes of activity of acid phosphatese. On the contrary, using them in the combination with feed pumpkins assisted the increasing activity of pointed enzyme by 13,5 %, and amylase - by 16,4%. The same changes can be the evidence in the change of intensively of process acid phosphorus and carbo influence with the help of the action of experimental feed index.

The productive action of research technology factors was evaluated by line and cost parameters of unsalty-dry skins marketable calves of silver foxes (table 6).

The material, shown in the table, signifies that the longest and the biggest by area were the fox skins of the 4-th experimental group, and the most expensive – the 2-nd.

6. Line measures area and the avaluation of the goods, skins of marketable calves of silver foxes, M±m, n=10

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
Skin length, sm	88,30 ± 8,25	90,70 ± 9,68	90,40 ± 10,27	94,70 ± 11,92
Skin width, sm	12,55 ± 0,50	12,80 ± 0,59	12,95 ± 0,55	12,90 ± 0,61
Area, dm^2	22,18 ± 2,72	23,32 ± 3,47	23,51 ± 3,53	24,55 ± 4,10
Evaluation, %	88,27 ± 33,88	96,86 ± 29,89	90,50 ± 30,02	93,35 ± 28,54
Average prize of one skin, grn.	888,70	968,60	905,00	933,50

It is explained by the fast that the increase of the part of skins of the highest size category, colour group and silver was observed in the animals of this group (tabl. 7).

7. Line and quality characteristics of unsalty-dry skins of silver foxes, % to total number of skins

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
Size catagory: 00	-	-	-	2
0	1	1	1	2
1	2	4	3	2
2	4	2	4	2
3	2	2	1	1
4	1	1	1	1
5	-	-	-	-
Silver group: 1	7	8	7	8
2	3	2	3	2
Colour group: I	7	8	7	7
II	1	2	2	2

III	2	-	1	1
Grade: I	7	7	7	6
II	3	3	3	4
Group flaws: 1	5	6	6	6
2	4	3	3	3
3	1	1	1	1
4	-	-	-	-

Studying the economic efficiency of using local juicy fodder in the ration of marketable calves of silver foxes showed corn middling with apple pulp and feed pumpkins conditioned the increase of the profit and cost effectiveness (table 8).

8. The economic efficiency of growing marketable calves of silver foxes

Index	Groups			
	1 – control group	2 – experimental group	3 – experimental group	4 – experimental group
Head	10	10	10	10
Saving of the heads, %	100	100	100	100
Expenses on the fodder during the period of the experiment, grn.	2879,2	2810,88	2742,56	2812,10
Saving money on the fodder, grn.	-	68,32	136,64	67,10
Expenses on the fodder, total, grn.	4615,9	4547,58	4479,26	4548,80
General producer expenditures, total, grn.	7693,17	7579,30	7465,43	7581,30
Production cost, grn.	769,32	757,93	746,54	758,13
Price of one unsalty-dry sky, grn. +/- to control	882,70 -	968,60 +85,9	905,00 +22,3	933,50 +50,8
Profit (loss), grn. +/- to control	113,38 -	210,67 +97,29	158,76 +45,38	178,37 +64,99
The level of cost effectiveness, % +/- to control	14,7 -	27,8 +13,1	21,2 +6,5	23,4 +8,7

Given in the table material testifies that the biggest profit and the level of cost effectiveness was in the 2-nd experimental group, animals of witch in the period of fur formation had the diet with apple pulp in the quantity of 4,45% in calories or 6,25% in the weight of fodder.

Conclusions and perspectives of forward researches: using apple pulp and feed pumpkins in the diet of marketable calves of silver foxes leads to not only improvement of the quality received product, but conditions increase cost effectiveness of its producing. At the same time, the curious regularity was established that implementing 40 g of apple pulp and pumpkins in the diet of animals assisted receiving skins longer that the control index by 7.2%, and to 80 g – apple pulp – allows to receive twice as much of profit/

List of references in the transliteration

References

1. Az-Buky`-Vedi tvary`nny`ka: Navchal`ny`j posibny`k / [V.A.Burlaka, L.P. Goral`s`ky`j, D.A. Zasekin ta in.]. – 2-ge vy`d. – Zhy`tomy`r, 2010. – 483 s.

2. Andrijchuk V.G. Ekonomika agrarny`x pidpry`yemstv: Pidruchny`k. – 2-ge vy`d., i pererob. / V.G. Andrijchuk. – K.: NNSU, 2002. – S. 400 – 403.

3. Anty`pov A.D. Ocherky` po fy`zy`ology`y` pushnыx zverej / A.D. Anty`pov, A.M Berestov, V.Y`. Volkov. - L.: Nauka, 1987. - S. 115-125.

4. Asaty`any` B.C. Fermentnыe metodы analy`za / B.C. Asaty`any`. -M., 1969. -740 s.

5. Babak B.D. Puty` эkonomy`y` kormov v zverovodchesky`x xozyajstvax / B.D. Babak. - M.: VNY`Y`TЭY`SX, 1982.- 52 s.

6. Balaky`rev H.A. Postanovka nauchno-xozyajstvennыx opыtov po kormleny`yu pushnыx zverej / N.A. Balaky`rev, V.K. Yudy`n // Metody`chesky`e ukazany`ya. – :NY`Y`PZK, 1994. - 31 s.

7. Balaky`rev H.A. Pry`meneny`e netrady`cy`onnыx kormov / H.A. Balaky`rev, M.V. Volkova // Fy`zy`ology`chesky`e osnovы: povыsheny`ya produkty`vnosty` mlekopy`tayushhy`x, vvedennыx v zookul`turu. — Petrozavodsk, 2005. - S. 14-15.

8. Balaky`rev H.A. Sovremennыe problemы v kormleny`y` kletochnыx pushnыx zverej / H.A. Balaky`rev H.A. // Matery`alы mezhdunar. uchebno-metody`cheskoj y` nauch.-prakty`ch. konf., posvyashhennoj 85-lety`yu akademy`y`. - M., 2004. - Ch. 3. - S. 146-148.

9. Berestov V.A. Laboratornыe metodы ocenky` sostoyany`ya pushnыx zverej / V.A. Berestov. - Petrozavodsk: Karely`ya, 1981. - 151s.

10. Berestov V.A. Zverovodstvo / V.A. Berestov.- S.-P.: Lan`, 2002.- 480s.

11. Bondarenko S.P. Kormleny`e ly`sy`cz / S.P. Bondarenko // Kroly`kovodstvo y` zverovodstvo. – 2014. - #1 (11). – S. 48 - 53.

12. Yevropejs`ka konvenciya pro zaxy`st xrebetny`x tvary`n, shho vy`kory`stovuyut`sya dlya doslidny`x ta inshy`x naukovy`x cilej // Zbirka dogovoriv Rady` Yevropy` Parlaments`ke vy`davny`cztvo, Ky`yiv – 2000. – Rezhy`m dostupu: http://zakon2.rada.gov.ua/laws/show/994_137.

13. Kudryavcev A.A. Kly`ny`cheskaya gematology`ya zhy`votnыx / A.A.Kudryavcev, JI.A. Kudryavceva // M.: Kolos, 1974. - 399 s.

14. My`lovanov L.V. Ovoshhy` y` fruktы v kormleny`y` pushnыx zverej / L.V. My`lovanov //Kroly`kovodstvo y` zverovodstvo. - 2003. - # 2. - S.4-7.

15. Muxomedyanov M.M. Y`spol`zovany`e netrady`cy`onnыx kormov y` by`ology`chesky` akty`vnыx veshhestv v pushnom zverovodstve / M.M. Muxomedyanov // Teory`ya y` prakty`ka y`spol`zovany`ya by`ology`chesky` akty`vnыx veshhestv v zhy`votnovodstve: tezy`sы dokl. nauch. konf. - Ky`rov, 1998. - S.62-63.

16. Ovsyanny`kov A.M. Osnovы opыtnogo dela v zhy`votnovodstve / A.M. Ovsyanny`kov. - M.: Kolos, 1976. -S.185-211.

17. Perel`dy`k N. Sh. Postanovka nauchno-xozyajstvennыx opыtov po kormleny`yu pushnыx zverej / N.Sh. Perel`dy`k, V.K. Yudy`n // Metody`chesky`e ukazany`ya. – M.: VASXNY`Y`L NY`Y`PZK, 1973. - 19 s.

18. Ploxy`nsky`j N.A. Rukovodstvo po by`ometry`y` dlya zootexny`kov / N.A. Ploxy`nsky`j. - M.: Kolos, 1969.-256 s.

19. Shkurky` ly`sy`czы kletochnogo razvedeny`ya nevыdelannыe. Texny`chesky`e uslovy`ya: GOST 2790-88. - [Dejstv. Ot.01.10.1991]. – M.: Gos. kom. po standartam., 1988. - 15 s.- Vved. 01.04.1994.- 12 s.