





# VETERINARSKI GLASNIK

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# VETERINARSKI GLASNIK



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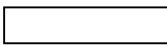
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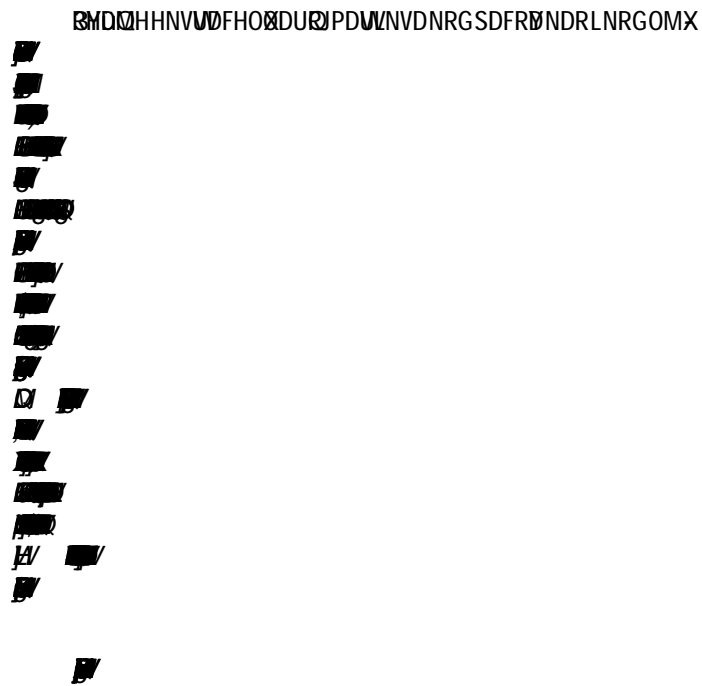


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## U NASTANKU PARAZITSKE FIBROZE I CIROZE JETRE

*DISTRIBUTION OF HEPATIC STELLATE CELLS AND THEIR ROLE  
IN THE DEVELOPMENT OF PARASITIC FIBROSIS AND LIVER CIRRHOSIS  
IN DOMESTIC ANIMALS*

MRONP41MYD



\* Rad primljen za štampu 17. 08. 2014. godine

U 7 W B .XQ 0 3W G 7 W B 1E Q W G 7 W  
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M W R R R R L D R R  
R W R L D W W X R R L R R P P  
J R R X G R W W R R M R R L R Y W R  
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2 W L 7 R 3 R R X R P R R J X G M W  
M X R P L R P R R W R X X R R W R R R 3 U  
R P R R R R R R W R R R R L Q  
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W R R R R 3 R D L 3 R R R R W  
W R R L R R R R R R R R R R R R  
D L R M W X R R R R M R R R R R R  
R Q L R W W R R L R O R R 3 R  
R R M R R X W L R R R W R R R R X W  
R D L R R M R Q W R R R R R R R R  
R M M R X R W R R R D X R R R R R W  
D L R R P R W R R R R R R R R R R R  
R W W Q J R R R R L R W W R R R R  
D R R R R R W W L R R P R P R R R R  
R R R R R G W R L R R R W W R  
R M R W R G R R R R 3 R D L 3 R R L D  
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PROVODNOMISYDULVVEFLMDMIGDVMKHEOLMDMHVVL  
 QLKRVXRJDEVDXODUJVMHEURHLFLURJHMHVNRGGRPDLEKRMZD

Picture1. Histological (a,c,e) and immunohistochemical (b,d,f) changes in the liver of sheep (a,b) and cat-  
 PLASMA SPACED MEMBRANE SHE  
 WITNESSSES  
 EPASPAE  
 HEPASBIBELPZB WITNESSSES  
 of PLASMA SPACED MEMBRANE SHE  
 WITNESSSES  
 ISMA on stellate cells placed on periphery of pseudoglobulus and smooth muscle cells of blood vessels,  
 ISMA, LSAB2.

MURP MX MHSULVNO KURCD HOLMVNLQWVVDVDMHQRG OLPFRFLV PDNURID  
 JD SODPRFLV LPDQJH EURMDHRLQCK JUDRFLV VOLNDH 8 MHVVD FLURRP  
 SHULVLRLGE HOLMHV MRPD LQV ERMH DQORP 2 HOLMHVX  
 DMEURMOMHD SHULIHULSVHOREQND LPDMXMRPD QODHE FLRSODPDVMH  
 QVMH LX QLKRRM FLRSODPL VH Q MGL QNRQD POKLVKHPMLVNX SRIV  
 QVW Q SRNDIX LEURME HOLMHX MURP MX NRMHRNUMH UJHE  
 UDM QREH SRIM HOLMHX MURP MX VX SROLPRUIE QHMVMV  
 RNUJHREOLNMD SOMLFHLOLESUDORQREOLNDVOLNDI

Diskusija / LVFXLRQ

DNURVNRSVNL XQRMHE SRMDQH MHVVRDVMV NRQVMH MDLOR  
 MHD EURX UDQPRV VMSHD NRMMDHVDOD NDR SRVOHGLFDGRVDMQ LQNFMLH  
 MOLNLP LPDOLP PHVOMHP QRM SDUDJVMH EURH UDQPRV VMSHD XMI VD LQ  
 IHNFMRPSUHEUD MOLNLP PHVOMHP MHRSLVDD LRG VVDE GUXK DRVD DUFV  
 LVDU 8 VMP LVSLDQ KUFPLD MHVMSURPHE QMIX Q GHUHJDFLMX  
 UHPRGHOLUDQMD MVD L ELOLMDUQLSHUSODIMXQRMHE PLNURVNRSVNH  
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0L0R00R00V00S0DUDJWNH0UR0HLFLUR0HM0W0HNRGGRPD00KR0W0**

**0000 0 0HGL0 MROM9 0000 ' R0000 0 000 7 0HNVL0000 6 0UH  
VLR000 GHVPL00 YPH00 LCF00 OLM0W 0URVL00W 0W**

**HPRL0 6 0GRUHW 0 0MDELW+ 0EW ' R0XVHW & 0L00 0G 0000 RIOLM0R0  
EUREODVW0RFKPL0RSK 0W**

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**ENGLISH**

**DISTRIBUTION OF HEPATIC STELLATE CELLS AND THEIR ROLE IN  
THE DEVELOPMENT OF PARASITIC FIBROSIS AND LIVER CIRRHOSIS  
IN DOMESTIC ANIMALS**

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**0UHDVL0RIW H0DFH000000L0LQ0DWDV00CDVL0000 RFF0VDVDFRQ  
VHT0EH RIKSD0FVH000000V D00000 R0MHF00000 0UN0V W0L0VW  
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D0DFR0HT0EH RIL0HF0RQV0KHS DQ 0DW 0W 0DU0VFLR00SD00D DQ VP00  
LFURFRHOL0GHQUL0FR 0H LMU VDPSOH00NHQURP FD00DQ VKHS L00FW  
HG0HU 0000 FRQL0R000W 0DU0DQ VP000H 0UH 0G LQRUPD0Q HPEHG  
GHGL0DUD00UD00LSV0UHVD0L0G0Z0PDR0LQ HRVL0QP0VVR0LFRPH  
PH0G DQ LPP0KVR0FKPLFD0 PH0G IRU0PRR0 P0FOHDF000 00W00G**





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\* Rad primljen za štampu 17. 08. 2014. godine  
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B M X B B B M B B W B B L B  
M B B B B B B B B W B B M P B

**WYKONANIE BADA BIOCHEMICZNYCH  
W SUROWICACH KRWI I W PRÓBKACH  
Z RÓŻNYMI ANTYSKŁADKAMI**

**Tabela 1.** Wartości sprawdzonych parametrów biochemicznych w surowicy krwi krowek i w próbkach z różnymi antykoagulantami

Parametr	EDTA	HEPES	Li	Cytrynian	Fluorko
Parametr	Q	Q	Q	Q	Q
Albumin	“	“	“	“	“
Total protein	“	“	“	“	“
*Glucose	“	“	“	“	“
R	“	“	“	“	“
3	“	“	“	“	“
%	“	“	“	“	“
1\$	“	“	“	“	“
8E	“	“	“	“	“
R	“	“	“	“	“
Cholesterol	“	“	“	“	“
LDL	“	“	“	“	“
\$	“	“	“	“	“
\$	“	“	“	“	“
\$	“	“	“	“	“
**7	“	“	“	“	“
RO	“	“	“	“	“

**Wnioski**  
Różnice w wartościach parametrów biochemicznych krwi w próbkach z antykoagulantami w porównaniu do surowicy ( \*p<0,05; \*\*p<0,01); przeprowadzone testem Wilcoxon

**RESULTS**

Table 2. Deviation in the values of biochemical parameters of blood obtained from the samples with different anticoagulants compared to the ones in serum

Parameter	HEPES	EDTA	Citrate	Fluoride
Albumin				
Total protein				
*Glucose, PPRO				
PPRO				
3 PPRO				
PPRO				
10S PPRO				
PPRO				
Cholesterol PPRO				
PPRO				
7 ,8				
67 ,8				
5 ,8				
**7 ,8				
PPRO				

\*/- not calculated statistically significant difference in regard to the serum

**DISCUSSION**

The aim of this study was to compare the values of biochemical parameters of blood obtained from the samples with different anticoagulants compared to the ones in serum. The results showed that the values of albumin, total protein, glucose, and cholesterol were not significantly different between the different anticoagulants and the serum. However, the values of some parameters, such as urea, creatinine, and bilirubin, were significantly different. The results suggest that the use of different anticoagulants can affect the values of some biochemical parameters of blood. Therefore, it is important to consider the type of anticoagulant used when interpreting the results of biochemical tests.

1. **1** **BRG B P** **BB** **X** **RM**  
**B** **X B** **D P** **B** **G M B J** **RP I**  
**B** **BQ** **B** **8B** **B** **BRG B P** **RP**  
**B** **LRRG** **7D LD** **RP** **B** **B** **Q B**  
**B** **B** **M RG B** **B** **B** **L** **B S**  
**B**

**B** **B** **Conclusion**

**3R** **B** **RX** **B** **B** **Q** **B** **B** **B**  
**B** **B** **X M** **B** **B** **B** **B** **B** **B**  
**B** **RP** **B** **B** **X** **B** **X** **B** **B** **B** **B**  
**B** **B** **B** **B** **B** **B** **B** **B** **B** **B**  
**B** **B** **B** **B** **B** **B** **B** **B** **B** **B**

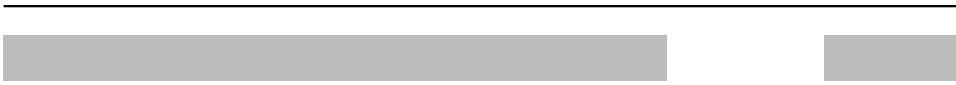
1\$20(\$ **ACKNOWLEDGEMENT:**

2R **LWDE** **HOH** **MHGR** **B** **B** **B** **B** **B** **B** **B** **B** **B**  
**B** **B** **B** **B** **B** **B** **B** **B** **B** **B** **B**

is research is a part of Project TR31062, funded by Ministry of Education, Science and Technological Development of the Republic of Serbia.

**B** **B** **B** **B**

1. **B** **%** **B** **05** **TRR** **%** **B** **0** **B** **%** **8** **B** **RP** **RP** **M** **B** **B**  
**B** **Q** **B** **B** **B** **B** **X** **B** **B** **B** **Q** **B** **B** **B**
2. **B** **\$** **BRG** **\$** **7** **B** **B** **RI** **B** **B** **B** **%** **B**  
**3**
3. **B** **-** **0** **B** **6** **B** **B** **7** **B** **B** **RI** **B** **B** **B** **RQ**  
**B** **B** **7**
4. **\*B** **\*** **B** **: G** **RR** **)** **B** **: 0** **B** **2** **7** **B** **\*** **B** **B**  
**B** **B** **B** **B** **B** **B** **B** **B** **B** **B** **B** **B** **B** **B**  
**RI** **\*** **B** **Q** **B** **B** **RI** **Q** **B** **BRG** **B** **Q** **B**  
**B** **RI** **\*** **B** **Q** **B** **B** **RI** **Q** **B** **BRG** **B** **Q** **B**  
**B**
7. **B** **\*** **B** **1** **RQ** **3** **\*B** **6** **B** **6** **3** **9** **B** **\$** **3** **B** **0** **RO**  
**B** **Q** **R** **RI** **B** **B** **RI** **B** **B** **Q** **B** **B** **B** **B** **B** **B**
8. **RO** **7** **7** **0** **B** **0** **2** **Q** **RI** **B** **B** **RO** **B** **B** **B** **EP**  
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**±**  
**7** **0** **\$** **B** **&** **B** **B** **(** **B** **B** **Q** **B** **B** **B**





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INTOKSINIRANIH ALUMINIJUMOM\*

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\* Rad primljen za štampu 01. 09. 2014. godine



Uvod / *DRGRQ*

188RW            M 8W            X 88            R8  
R8Q LD            0H LD            88            D 88            X  
88            88            Q 8M            88            D 8P  
8W            88            L8P            88            88  
Q 8M            X 88            88            Q 8P            8H  
88            8W            88            RR8            L888  
88            8Q            88            L8            8W            8            D  
RQLD            88            8 8U 8            R8i 8W 8N 88            R8P  
88            LD            88            M8 88            88            88  
88            88            X 88            RM M 88            RGR8 8G R8            88            8W  
88            8 R8            88            88            88            L8            88            X 88  
R8P            8 8G 8W            88            L8G 88            8S            LD            8W            LD  
888

88 88            8 88            8 888            88            88  
8W 888            8 8W X 88            88            88            88            D8  
88 8W 88            LD            88            Q 88            R8            88            X  
88            88            88            88            88            88            88            8  
LRM            Å 88            L8            RR8            LD            88            88  
8P            88            8G 88            X 88P            88            88            88            D  
88            X 88            88            8W            L8W            88            X88X            Q 88            M  
88            8 88            88            88G 8 88W            88            88            X8  
R8P            8 888            88            88W            88            M 88            Q  
888888

DMMLMDOLPHRGHUDGD DMMLDODGPHKRGV

8 8P            8 88            X 8Y            W            L8            8            R  
M 8W            X 88            X 88            W 88            88W            L            W X 88            D  
88            8P            88M            88            LRG Q 8W            RG 88            °&  
88            X 88            X 88            D 88            RM M R88            8W            8W  
8888

88            X 88            8Y            8M            RG8W            Å 88            88  
88            Å            J 88            88            88            88            W            R8W  
8W            88P            88            X8L RG            D 8P            88            88  
8Y            X 8W            88            88            88            88            88  
8W            8W            M 8W            88            D88            88            88            88  
MX 88            88 8Q            88            8 8M 8W            88            M 88            88  
88            88            88            88            88            88            88            88  
88            88            88            88            88            88            88            88  
88            88            88            88            88            88            88            88  
8888



Rezultati / *EEG*

0LND 50DW5SRUDDHSRIUHNMDPSRGUHPDWHGQDWHGRLV6DU GD  
JUHNDJXLNRQROCKLDEWYUDCKSDRBLQDQSHULRQDORJMMWDCKDORLQ -  
R

Picture 1. Relative increase in power per frequency ranges- average value and standard error in the group of the control and anesthetized rats, intraperitoneally treated by aluminium



FRONTOCORTEX  
NRGSDRBLRMLQJDKDORLQMRP



Picture 3. a) Fractal analysis of cerebrium EcoG in aluminium treated rats: 1st group - per os, 2nd group - intraperitoneally;  
b) Fractal dimension of cerebellum EcoG in aluminium treated rats: 1st group - per os, 2nd group - intraperitoneally

Picture 4. Fractal dimension under conditions of oxidative stress

nego na malom mozgu.

## Diskusija / LRO

FRONTOCORTEX  
NRGSDRBLRMLQJDKDORLQMRP

neurotransmisiji.

BR X M V LARP BQ X G RGRD  
BRW 8 BP RQ B BQ BM BP  
BP B G V SD LB R W R R  
BRG B U S V W M W B  
BP V B V BP BRG B BR X RD  
BM W R M RG BD W BR V .RG  
M MRW RP V W RQ NJ  
W M S X BR W 2BR V Q F H  
BH RRQ BQ M W 2M BR BR V  
BRBRBR

**[Redacted]** Conclusion

ACKNOWLEDGEMENT:

ELMH This work is supported by Ministry of Education, Science and Technological Development of the Republic of Serbia.

**[Redacted]** /LWBW 5EM

1. ES 10 ORB 5 K % D 3 B \$ Q 1 R BREV Q W W  
BWBW
2. B \$ BQ 1BW B Q BW BM Q 1<  
B  
BBB 07 B / RW 0 9B 3 RB / BW BM W B Q  
W B B Q W W RQBW BW Q BU RIW RI  
BWBW
4. RB 6 RQ \*9 1BRE W RIW B B RB B  
RW \$ B B Q B BB BRO RIW W RI  
B  
OW M BB - B 6 BQ RIW BB W RI RQW W  
W B  
OH + B ( BO 0 BB \$ RE W RI RQB B Q W  
BWBW
5. B 6 B \$ B 0 \*B \* OW M W B RIW B W W B  
BWBW
9. BY , RW 0 BY \$ RW ' RD 0 BW , 1BY 0 W RI  
BWBW
10. BQ - BQ RIW Q W W RCB B Q B BW RIQ B  
BQ B B B 3 B 0 5 ORRH 3 : B :
11. RB 6 B \$ B 9B / \$ B RB RI B B 9B W B  
BWBW
12. RB BWBW

ENGLISH

FRACTAL DIMENSION AND NEUROTOXICITY IN RATS INTOXICATED  
BY ALUMINIUM

DUDMLOMDQ

H XMG DQBO RGHORIBXURFLVWQJDK SURYLWNGSRVELOLWVG\  
LQ ELRORIFSDMSKRORIFDO SHQDQ LQYLYDQ DIWUJUGVLQYLWFRQLWRQ  
N DQOVV RIHOHFVFRFRUFDODFWYLVWQ BMBWFDQ FNGV FDQGHFULEW  
FBBV LQXFHGE\ DOXEPP LQ\FDWRQLQJWVQDQDQBO RGHO Q SKRORIFDQDQ  
SDMSKRORIFDO FRQLWRQ RQSHULWDO RGHOVVFBQF UHODVFBQF LQ  
EHYLRISODMFLWQ DFFXRODWRGIDOXEPP LQBUYRXVXW RIV UDYUDLBUH  
REMUYHQBDO RGHOVRIUDWKMGLW HSHULW GHFULEHQBQ LQ URXS  
RIEXURQODFWYLVWUEUDLBIUDMGLIHUHGHRILQ\FDWRQOXEPP

KV XG\ GHFULEHQB DFWYLVWQ EUDLQUDWKGHUBMMD LGERWW  
FRORODQ DOXEPP WHDWGQBQOV JDFWODQ SHFWDDQOVV DV XMG W SUHWV  
TXDOLDWQ TXDQWYHFBBV LQW FRQLWRQRIEXURFLVWBBV LQEXUR  
VDEVRQ DVBOODVW WAFXUHDQ IXEVRQRIW EXUDQBUN DUHFREBNG  
W W ROHFODUSKRORIFFBQF RIEXURFLVWQXEQXP WFLWQOV RQ  
WUHQVXK FBBV LQDXDQWUUF DFWYLVWQ FDOFLXBBQ DFWYLVW% SHFWXP  
DQOVV EXURFLVWQ GHFULEHQB FBBV LQSHFWDSRBULOW FRUHSRQ  
LQ IUHTXHEUDQV % FRBDULQW ) RI LQ\FDWRQ DQ FRORQLGLYLGXQDQ  
DV REDLQGW UDE RIV FBB LQFRUUHODWQW FRUHSRQLQSDMSKR  
ORIFDQQLWRQRILQ\FDWRQ N BB LQ EW EHDQLQ\FDWRQEXURFLVW

HRUGWFLWQOXEPPDOFLXQDXDWRJGDWYHWVH

MBBC

NDLEQYAFQHKGGCHLHDEGHKMDUK  
BGLHDEBHGUGOEXFBGBF

Ebbjz

Bkiaa  
iibab  
ab  
bb  
ab  
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djuk	zdmfep	b	z	g	l	h	d	j	b	b
g	z	z	\	g	l	h	d	j	b	b
<	i	j	k							
djuk	ih									
klij	z	m	d	g	l	h	d	j	b	b
guc	b	n	j	z	g	l	h	d	j	b
ag	\	m	s	g	l	h	d	j	b	b
k	r	m	d	l	m	j				
b	n	m	g	d	p	b	g	l	h	d
g										
g	eml									
l	j	z	g	l	h	d	j	b	b	
g										
b	g	l	h	d	j	b	b			
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b
k	l	j	z	g	l	h	d	j	b	b

k\_      e\_      l\_      g\_      d\_      m\_      h\_      e\_      g\_      k\_









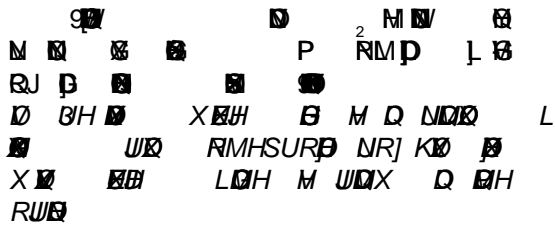
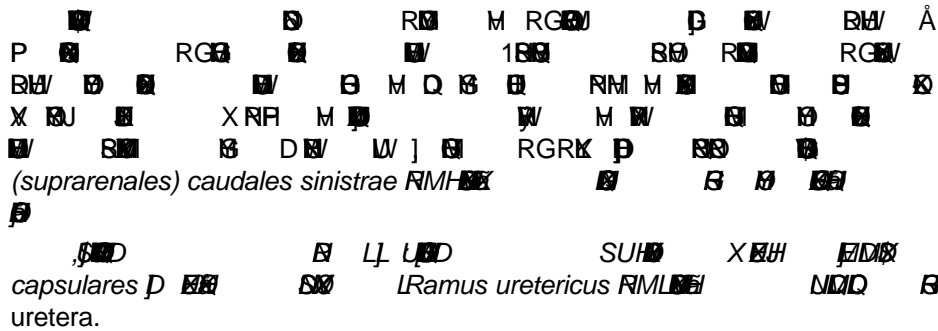


Aorta abdominalis i njene grane kod tekunice (Citellus citellus)

RUB  
UB  
UB  
UB  
BUR  
UB

Picture 1. Aorta abdominalis and its branches in ground squirrel (Citellus citellus)

1-Aorta abdominalis, 2-A. cellaca, 3-A. mesenterica cranialis, 4-A. renalis dextra, 5-Aa. renales sinistralae, 6-A. testicularis dextra, 7-A. mesenterica CAUDALIS, 10-A. iliaca externa sinistra, 11-A. iliaca externa dextra



6-rozivni preparat vena bubrega kod tekunice, posmatrano sa ventralne strane lis sinistra

URSRASED

1 - V. cava caudalis, 2 - V. renalis dextra, 3 - V. renalis sinistra



MMFG  
tellus citellus

SRUHH

Macaca fascicularis i 0

RE LD S  
X hilus renalis L D DMD M Q SUX LIX  
W B M DDMH Q KRPP SW RGBUW B K D  
RX G M RMH SRME SUD DMD SUDH  
URUD sinistra D L D DMD SUDL  
RU sinistra RMH X K M SUREDX N  
S

Sinus renalis

RG -E D LD M D DMD SUH  
K D M B Q SUP L D B D DDX BUD  
B D 8 K D B D SUP L D B D DMD B  
M RRR Q N D L W RMH GH WIX Q B  
B W D 1D B R L M W  
B W D W D L B B  
B

.RG B L B B L B B W M X  
B Q A B RM M D B RRR Q A W -  
B W 3RG P RGA B B W B A B  
S

.RG -NY LD OD LQ NY L  
D L D B 3R L D B L B W  
B X B J B B L B L B M B Q B  
B

.RG J W -NY LD B L D  
B W B X B M Q Ramus dorsalis i Ramus ventra-  
lis B L D DDMH X B B Q Ramus dorsalis i Ramus  
ventralis R D M SRME W RMDM SUD XNDP SUD L X  
B L D B B Q QRP P NDX B B W  
S

RG BUB K L B BSM LD B L D  
B DMD M Q RMRMQ M B Q ND L D DVL  
M .RG B B J B D B L B B B W  
B L B B W B P L P P P W  
B

RG B B B X M B B  
B

.RG W B L B B B B L B B 9  
cava caudalis BH B X K B B B RGDK M B Q ND L  
B W RMHSUR NRJ K B B B X B B LGH M  
WDRW

RG B Macaca fascicularis i Macaca mulatta RUB L D  
B B B B X B NY L D D B B RMHR B NY





- 9. NY + .RWY ' 9ED ' RRD DP RIRF BD RD QD/ D
- 10. -ED 2 ONY ä 3RBY 6 9ED RIW D D Mustela vison SKY
- 11. -BY ä BM ' BM = RBQ B W B B B
- 12. OD \$ BQ % BBU DP RIW D/ P & BQ 3D \$ 1990.
- 13. OD ( 3RD + D/ -3 B 0 BQ W RQORU Q BQ BQ D -RD RIBBD W W RI9E W
- 14. 1ED 29 B \$ B 1\$ \*D 5 B \$ .RD 6 .D 1, .RD & ORD RQ QW W \*BQ B X
- 1ED = D/ ' BM = BY ' K W Q D QW BQ B Citel-  
lus citellus B
- ED = BMH = D/ ' RRDH ' KH RQ Q WH RQ/ RIWH WRQ WUB  
Citellus citellus B
- ED = BMH = BURY ' B ' H , (MBSB/ Q DBSB/ B RIWH SRU-  
D/ W QW BQ B Citellus citellus B/ W B
- ED = B ' BMH = OBY 9 UB ' RUU = KH B DQ Q W  
BEM Q WH WRQ WUB Citellus citellus B/ W B
- 19. 1RD B B W W BQ B BQ 3D E W BD B/
- 20. 3RD 3 BY 9 RW - \$ RDX W RDP RID BBU D 9RD RB
- 21. 3RD 3 BY 9 RW - \$ RDX W RDP RID BBU D 9RD W
- 22. B 0- W/ -( K W D/ W RIW B B K B B K DP
- 23. BM ' -BY ä 1ED = K D QW BQ B Citellus citellus Q W B
- 24. BM ' -BY 1ED BRD W B W BQ B itellus citel-  
lus B
- BMH ' -BY ä ED = KH B B Q WH WRQ WUB Citellus citellus  
, KRUSKDP B
- BMH ' ED = UB ' KH B B Q WH WRQ WUB Citellus citellus ,,  
BSKD B R -M B B BQ Q W \$
- 25. 9 \*B % B \* K B W RIW RBE RIW B
- B itellus citellus BRSSE





ehZ  
mguo

< hZ ukiZgb jZb Dgu bDgu qhZ  
k av\_ agZb iZk kaZb ukilZguo guo  
Z gb gh dgIajw nmgdpb eguo h b b nZab  
wndlu agZb \ aD h Z h b b Zab  
imle guos hZbZabZ

h f jZb gZndb bmgb kZb leZ kledZ Citellus citellus  
k pevX ijbfggy \ ukijfgIzvguo bkkehZby ihZmIZ bamgb\_  
Zjh b fbdjhdhibZdhc kljmdlmju Z IZ hlgHrgby hZvguo hZj\ b  
kklf hZj\ ey hijegguo bh\ bkkehZvkdhc Zevghklb <  
jZjZ urmihfmluo bkkehZbc gZn k hklZvgufb ZIdZ bfl  
agZb\_ bamgb\_ kDmejbazbb ihd W [eh hZhc ba jbbg ihfDkbo  
gZ hZlvky d bkkehZbx Zb kZkhkhkmbklhc kklfu kmkebdh\  
kihkhklmy bamgbx kljhgby leZ Wj bhlgHj b lZbf hZjhf gklb khc  
leZjblevgmZfbx

BkkehZkmkebdihqZdmejbazby

INFEKCIJA OVACA SA *Strongyloides papillosus* – UTICAJ INTENZITETA

~~XXXX~~

BIOHEMIJSKE PARAMETRE U KRVI OVACA\*

INFECTION OF SHEEP WITH *Strongyloides papillosus* – THE EFFECT OF INTENSITY OF PARASITIC INFECTION AS WELL AS THERAPY WITH ALBENDAZOLE ON CERTAIN BIOCHEMICAL PARAMETERS IN THE BLOOD OF SHEEP

LPLWULMHYLYLGLPLURYLQDDDLFLY  
BYLQDHLGLPLURYLQDDUDO

OM RYRJ UGDG MH GD VH LVSLWDMRGUHYICELRKHPLMVNL SDUDPHWUL  
XUYL RYDFD XORYLPD UDDLPWRJLWHDVHWD SDUDIWNH LBNFLMH VD  
WURDRLGHV SDSLOORVXNDR L DNRW HUDSLMH DOEHGD RORP VWUD  
BYDQHMHL YHGHODR YFDPDYLUWHPEHUJUDVH QIRGNRMLKMH  
WYUHOYNLVUHGO LLYLVRNLLWHDVHWSUDUDIWNH LBNFLMHVDSDSL  
OORVROUROXSDOHVRYFHEDWLYEDSULVWYR  
SDUDIWNH LBNFLMH WSHCYUVWDSURPHESUDHOCYRGUHYDQHP  
NREHQUDFLMH JOMRH XCK SURWHLQDOELDOEFLDOEFLQ  
RGEVDEHMSXRELOLUK LND OFLMRDIRVIRUDMSXD N  
WLYR/WLQDNWDWGHKLGURJHDIHLRHPVNHLVWULEKLMH/+

D RVEYXRELMHCK UHWDWD WYUGLOL VPR SUHNR LRHPVNHL  
GLVWULEKLMHODNWDWGHKLGURJHDIHGDWRNXDUDIWNH LBNFLMHVD 6  
SDSLOORVXGRODI GRRWHEWHDHOLMDMHWUHVP RPLADLSOXGRN  
MHONRWHUDSMHDOEHGD RORPMHWUDDMRWHEMLRUJDEHQUDFLMD  
JOMRH XCK SURWHLQDOEFLDOEFLDURMHRSDGDOD VDUDVWRP  
LWHDVHWD SDUDIWNH LBNFLMHS DNRW HUDSLMHDOEHGD  
RORPSDGNREHQUDFLMHRYLK SDUDPHWUDELRMHQWWDWLWVNLQDWR  
YHEPDRXSWLYR/WREHQUDFLMDXHHLSX  
ELOLUKLDWDRNRYXLEDRUDVOH VD LWHVWWRP SDUDIWNH LBN  
FLMHS DNRW HUDSLMHVD SNWLYR/WB NREHQUDFLMD

\* Rad primljen za štampu 08. 10. 2014. godine

U W B BMH W GRU GU W B BOK -RY GRU GU  
W B OQ -BBY BRU BIRU GU W B O B GRU GU  
BORO BIRW BB 8W W-  
OX SD 1SD -BBY GUW 1D W P W RD SD  
GWOBBRZ

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]

Uvod / URGWLRO

X P Q LX Q Q  
MH QD ] RU QD X PM QML RD W Q  
MHX Q Q MBSB GU SWX LRB SB  
[REDACTED]  
8QD QGRH RD MHQGX QGRD  
MHQGRH Q RA M X PM Q RD Q SDH Q  
Q QJ RRF MHV X EP Q QRP D QX  
W Q Q QH D GQ W W MH  
LDH Q XQ BGR QH QH S QP W RM  
W QH RD GRQ Q QH Q QOE QD  
RQW W RMHX S RRMQL X QB QJ Q  
QSD QWD QSD BQW BQGH Q LB BQMH M GD  
MH BQGH Q LB XNL QR Q QH RD D 6  
papillosus

W Q Q Q XW M R  
X GDSS W RD QX LQGR M IRB RMGR B-  
MQJ BQGH XW 2R MHJ RJ Q QH D QRL  
des spp Q Q W Q B Q predstavlja-  
MXW Q RMHX XQP Q RD .D  
QW LD QD RH W BQ QBF Q RQ  
Q Q LRGH Q Q QMR / D W BQD  
QF RH Q QH 8 RRP GQP Q QH QP  
RWX M Q W D QR GQ BQMH B RF BQ RD  
RW SWX QR QR Q W RD RW LQ

QBS MHQJ W GMW LB RD XW  
QILQGRH LGM W QD .D \*Q Q  
RMP % RWH RM HV MHV QBM QH D QW E

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Materijal i metode / Material and methods

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Uzorkovanje fecesa i krvi / DPSOLRDIHFHVDGEORRG

BUNRYDQHIHFHVDPSDUDLWRORNLSUHONG

Sampling of faeces for parasitological examination

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

999999999999  
papillosus

8 RIX LG/L / LOKK P/MQ RQ QR X  
QQ QM P GIX / LOKK P/MQ RQ RMLM Q  
PX Q RIRQB LRIRQB / MMDQ D GV  
RQ  
.RQB GMQ/ MHQ RGD Q/H LRQH .D  
D Q / Q MHQ IX [ L [ Q QRS  
/ 1/ / /H RGD MHRMQR MDQ/ B  
/ IQ RGRP B OF O/ / L RQ

Uzorkovanje krvi / DPSOLQIEORRG

RUFL NURYDFP SUHGYLHQ VSLWLYPNDVXSQFLMRPYMDDULVX  
NVLUDQBYRWLMSUHGHHKOPLWLPFLMH GDD RGGHKOPLWLPFLMDS  
HR NUYLUNRYDQMHEJDLNRDQDDQX FLOMXYDMDNDYQJVHURD DGH  
VDKSDULQP NDRDQVNRDQDQRPX FLOMXYDMDNDYQESODPH GURL VX  
RGYMDQSRVOYSRQDQNRDQDFLMUYEHQULIXUDQHR WUDMDQX PLQ  
W/Q B DQ Q /H Q M 2M GRMQR QB  
QR °GRQ

Biohemijske analize / LRFKPLFDODQOVHV

.RQWUDFLMDQRH X NUYRGUHQ MHRULHQHP3UHFLVLRWUSOX  
WHWUDNDWLYQVWDPD \$ RGHYHQ MHLQWLNLPHWRGRX UHDFNML  
WUDQDPLQFLMHLQUSH NRMDWDOLQYDMDP .RQWUDFLMDHMHVD-  
RQ RGD Q / RGRP D QP .RQD XM  
Q Q/ RGD MHP RGRP GRMHRQD Q  
RGD RRP D QO Q .RQD QJ Q X  
D RQXQJ LQXQJ Q MHRGD XNL D GRQ -  
MR MRQP Q .RQD Q/ RGD MHXNL D  
D RQRP GRMHRQD IRIRD RGD XNL D RQ -  
MR RQBP Q / RGD X RQF RQD W /  
B W QP Q/ QRRQ

merenja izvedena su na aparatu 9996

8Q QW /+ LRQ RQ W GQBP /+ 1 /+ 2  
/+ /+ 4 /+ RGD X QP QMRBP Q \$ +2-  
\$ 0,1, 9( Q /.% QD 8Q QR X B  
Q QJ QRRQJ  
QR RGL RQD Q / / RGDH GV -  
QM RQF RQMU QJ / RQ Q W  
RQ QS / W SMBQ RQ Q MHRQ -  
QRGRQW

**S. papillosus**

Table 1. Intensity of parasitic infection with *S. papillosus* (average value ± standard error) before and after dehelminthization with ABZ

**Rezultati / Results**

Table 1. Intensity of parasitic infection with *S. papillosus* (average value ± standard error) before and after dehelminthization with ABZ

Table 1. Intensity of parasitic infection with *S. papillosus* (average value ± standard error) before and after dehelminthization with ABZ

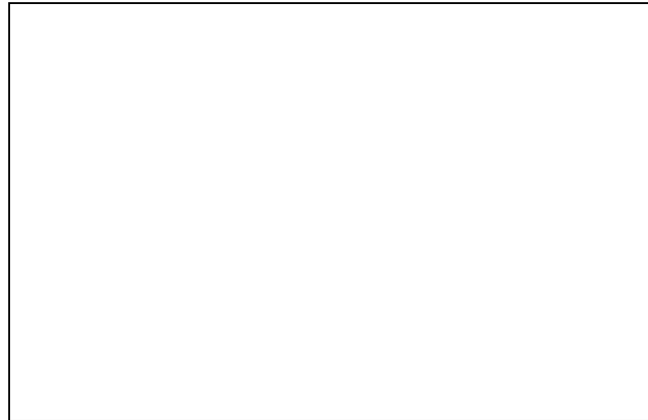
Table 1. Intensity of parasitic infection with *S. papillosus* (average value ± standard error) before and after dehelminthization with ABZ

|                               | Intenzitet infekcije sa <i>S. papillosus</i> (br. jaja/g fecesa) / Intensity of infection with <i>S. papillosus</i> (number of eggs/g of faeces) |                   |      |   |                  |     |
|-------------------------------|--|-------------------|------|---|------------------|-----|
|                               | Pre dehelminthizacije sa ABZ / Before dehelminthization with ABZ   |                   |      | Nakon dehelminthizacije sa ABZ / After dehelminthization with ABZ |                  |     |
| Grupe ovaca / Groups of sheep | \$ <sub>1</sub> Q  | \$ <sub>2</sub> Q | \$ Q | B <sub>1</sub> Q  | B <sub>2</sub> Q | B Q |
|                               |  | "                 | "    | "   | 0                | 0   |

**Rezultati biohemijskih ispitivanja krvi / Biochemical test results of blood**

Biochemical test results of blood

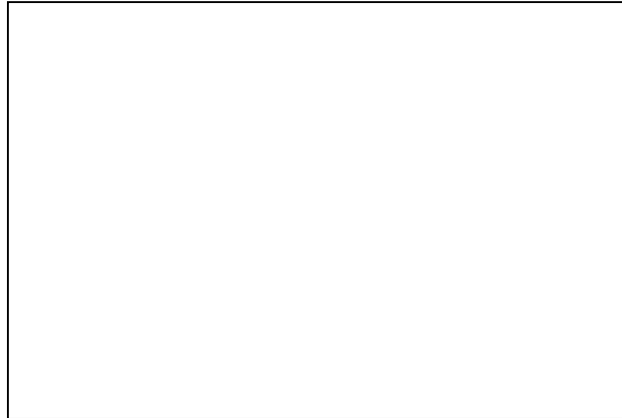




\*BQ .R/D)HNR/LBGG/

Graph 1. Concentration of glucose in the blood of sheep before (A) and after (B) dehelmintization: the group with low intensity of infection (A1-before and B1-after dehelmintization), the group with medium intensity of infection (A2-before and B2-after dehelmintization), the group with high intensity of infection (A3-before and B3-after dehelmintization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \*p < 0,05; \*\*p < 0,01; \*\*\*p < 0,001 in regard to control group C1; +p < 0,05; ++p < 0,01 comparison between groups before and after dehelmintization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

grupe dokazano je smanjenje koncentracije proteina u grupi sa visokim inten-



Graph 2. Concentration of total protein in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \* $p < 0,05$  in regard to control group C1; ++ $p < 0,01$  comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).





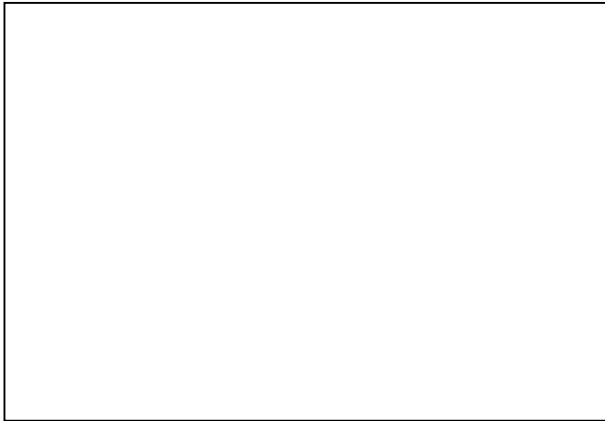
Graph 3. Concentration of albumin in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \* $p < 0,05$ ; \*\* $p < 0,01$  in regard to control group C1; + $p < 0,05$ ; +++ $p < 0,001$  comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).



Graph 4. A/G ratio in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \*\*\* $p < 0,001$  in regard to control group C1; + $p < 0,05$ ; +++ $p < 0,001$  comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

9:00 AM  
papillosus

8R0 M GD\$ R0 0 0X 0D 0 X0 0 W LX0  
 R0 00 G0H 000P LGR0 0 00W X0  
 0 R0 0 00P 0P 0H RG " XRG0X Q R00  
 0  
 0G0W 0 00



\*0Q 0000000000  
 0000000000 00% 000  
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Graph 5. AST activity in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \* $p < 0,05$ ; \*\* $p < 0,01$ ; \*\*\* $p < 0,001$  in regard to control group C1; + $p < 0,05$ ; +++ $p < 0,001$  comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

000 000 000 000 000 000 000 000  
 GR00 000 000 000 000 000 000 000  
 MIS 100 G0H X0 0 0 00 00 00  
 GR0 0 00W L0W " 8/ XRG0X Q 00  
 RR000  
 00 0 R0H 0 X0 R0 0 L00 G0  
 000

AP RH D GRNK D XN AP W RH  
RR RH RV R GH RD M D  
RQV RGR



\*Q .R  
DHRH\$      %      RC  
DHRH\$      %      RC  
DHRH\$      %      RC  
H&      RC  
RGR

Graph 6. Concentration of urea in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \*p < 0,05; \*\*\*p < 0,001 in regard to control group C1; ++p < 0,01 comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

AP RH D XN AP W RH  
MHW XRW RGV RH D H W D  
RW XRGX Q RQ &1 " H S! 1RQ G -  
RH W MHW RH J R RG R RMDMH  
D D W RH Q X W DRW S "  
H RG D RPE AP RH Q X S "  
H LRG R RMDMH XN W W RH Q X S  
" H XRX D RRP &1 grupom. Interasantno  
MHW GDMRG RQ &2 W RW RH J

1 grupu.

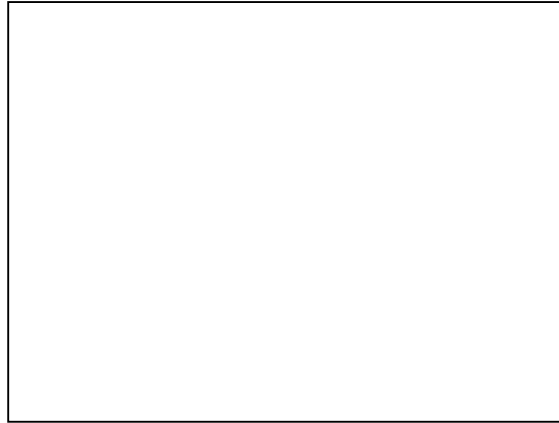


\*Q .R  
%  
RQ  
RQ  
RQ  
W  
S  
%  
% \$ % \$

Graph 7. Concentration of total bilirubin in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \*p < 0,05; \*\*p < 0,01; \*\*\*p < 0,001 in regard to control group C1; +p < 0,05; ++p < 0,01 comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

RP RPH  
W NH D SX  
RPH X RP  
NH D E W  
1RQ GRH D % W  
M X RP  
B LRD GRH  
" V " /  
/ Q RX W  
R W MHS RPH  
Q

W MGDGRD GRSD RPH  
R D RRP W  
XRGX Q R &1 S !  
M GDGRD GRSD RPH  
R R R R R  
" V " " V "  
W LXRGX Q R &1  
S W LRG R &2  
XRGX Q &1 S

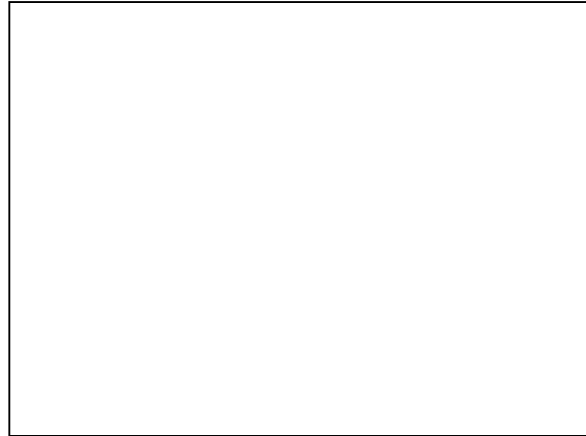


\*E

| Group | Before | After |
|-------|--------|-------|
| A1    |        |       |
| A2    |        |       |
| A3    |        |       |
| C1    |        |       |
| C2    |        |       |

Graph 8. Concentration of calcium in the blood serum of sheep before (A) and after (B) dehelmintization: the group with low intensity of infection (A1-before and B1-after dehelmintization), the group with medium intensity of infection (A2-before and B2-after dehelmintization), the group with high intensity of infection (A3-before and B3-after dehelmintization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \*\*\*p < 0,001 in regard to control group C1; +++p < 0,001 comparison between groups before and after dehelmintization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

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RG  
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D  
B  
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M  
M



\*8Q .R/DRI RD/R R R R R R  
R/R/R/R/R/R/R/\$  
R/R/R/R/R/R/R/R/R/\$  
R/R/R/R/R/R/R/R/\$  
R/R/&  
R/R/R/R/R/R/R/R/R/R/\$  
R/R/R/R/R/R/R/R/R/\$

8/2% 8/8/8  
8/2% 8/8/8  
8/2% 8/8/8

S  
% \$ % \$ %

Graph 9. Concentration of phosphorus in the blood serum of sheep before (A) and after (B) dehelminthization: the group with low intensity of infection (A1-before and B1-after dehelminthization), the group with medium intensity of infection (A2-before and B2-after dehelminthization), the group with high intensity of infection (A3-before and B3-after dehelminthization); C1-control group of sheep negative for parasites; C2-control group of sheep negative for parasites and treated with ABZ; \* $p < 0,05$ ; \*\* $p < 0,01$ ; \*\*\* $p < 0,001$  in regard to control group C1; +++ $p < 0,001$  comparison between groups before and after dehelminthization (A1 vs. B1, A2 vs. B2, A3 vs. B3).

AP CH Q EX W DRW S " 8/ D  
RG D BPE L& AP W CH Q EX R  
RW S " L " 8/ X RGRX Q R& &<sub>1</sub>  
R RJ P RG D BPE " 8/ S LH W  
AP " 8/ S W CH X RGRX Q R& O  
& &<sub>1</sub> ORE B&P B LB G&H W  
P X W DR B BRW /+ BQ W D % Q EX  
W DRW S B&P W RRJ P RG  
R&O B &<sub>1</sub> L&<sub>2</sub> W M&G D W D % GR&GL&R&B D  
D&R W NG R&O &<sub>2</sub> W " 8/ Q EX W  
DRW





Q RMLX RW RRP W /+ BX BEX RW W LRD  
W RP GWH /+ /+ /+ D X X W D -  
RP RP GWH /+ W MGDW W W D  
WH GRD GRGD RRJ RRJ RD X BEX D RBP  
&1 WP Q BX W DW S 1BQ B % W  
RH X RD B BW /+ 1 RMHM M W B B RG  
B D B BP WH XRGW Q RQ &1 B S  
R RQ &L&2 B WH W W BQ D S!  
X RRM GUL /+ B B RG/+ 1 RG K B W MH  
B B WHW /+ 2 XRGW Q RQ &1 B Q BX W  
B BW S 1BQ B % RG K W B X W  
B BW /+ 2 RMHM B W B RG&1 B S!  
O W B B B B LRD GWH W  
X W N B B B BW BQ GWH S B  
LRG RQ &2 B GRD GRGD RRJ RD /+ 2 XRGW Q &1  
Q BX S BP RP GWH /+ W MGDW  
W B W WH GRD GRGD RRJ RD RG K B Q BX  
S XRGW Q RQ B &1 1BQ WH % W B  
B BWH W MHR RG B D B BP WH S  
WH XRGW Q &1 B GRMHR B D BPE LRB BP  
WH W WH /+ Q BX S .RG RQ &2 grupe  
W B MH W B BW /+ X BEX D &1 BP S  
W MGDW /+ 4 B RG B B D BX X  
RGW Q RQ &1 B D B W DW S! 1BQ  
GWH W MHRH W RRJ RP /+ RG W  
B D BPE S LRB S BP WH 1MHW  
Q W BQ D B &L&2 B S! BW /+ je  
B BQ RG B D B DB RG B D BPE LRB  
BP W WH XRGW Q RQ &1 B Q BX S  
1BQ GWH W MHRR G W RGV B X W  
GQP BX B BW RG B D B LRB RG B D B  
BPE LRB BP W WH Q BX S W  
MHDMH % GRD GRGD W RP /+ kod kon-  
B B 2 B B 1 W

Diskusija / LVFX/LRQ

W GBB MHV B RMLWH B B B  
MXB B B BX W X W 1RQ XRB  
B B BML B RP RD /+ /+ B RGNE  
B B B B







Literatura / BIHUEHV

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28-41.
2. \$ R 0\$ QED 0 2R 0\$ ORB 0) ARE HW RIBB  
-3 R 3 R \$ RB RBW RIW Q W EG 1W M
4. \$ ORB ( RB & RB RIBD W W W W W W W  
% RBP 6 .RMM 6 RMBY (W/ RI BQ W W  
RGM BX Q RBB W RQGBB RIRGBD -  
\*\$ OB ( RARK % W \$ R RGM 1RGD RI Q W  
RRE RGM RI W W/ W/ GIB W RB RB -  
- RB W GM RM R R GRW ± R  
GHBB ± W W GIBB 9W RBQ
8. \*RB . 0W \*6 R RIW RBW RM GR MQ Q BQ  
RQW GBB RB BQ Q W B Q GBB BW
9. \*R \* RB -3 R 5 RB 93 .R \$ (W/ RIBD W Q  
IRBQRGRIBB/
10. +B % \*RH -0& H BB Q RBW Q OBB G B 2[RG 8W  
B
11. -B + \*RW \*- BB \$ +RQ -\$ B ' /W -- 0B RI  
RRE RB
12. -H \$ /QW < B & RB 5 \*W 0 /GRQ + RB B  
W RIBB RBQ , Q W GBB RB IRUGB W  
RBB  
.D 7 9W RBW RBW /R +RM -RQD +D 2[RG  
2%
14. .R/D 6 B 9 \*RM B Q BBA W Q W W W W  
B  
0B 67 BIR 0/ GB 0\$ \*BBA Q W RBM B  
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2W . B 9 W ) \*B - W & +BP 6 /B & W  
H 6 2B/ GB RI Q BB B GB RB RB W  
±  
B 5 RB \$ W/ W B B B /, B B IRUW GBV RI  
BBAW BBAW
18. B / .B 5 0B 3 Q W BQ RI+BB RBW IRUW H  
B DBQ DVB B RIW OROB B
19. B 0\$ W RBW W W Q GW B W W W W W W  
B
20. BBS BBRBP
21. B 6 W /M W RW GRB RWD W W B B B

**EWODVONLPLWULMHYLW/DUINFLMDRYDFDWDURQLGHV**  
*papillosus*

22. RGD 0 &lt; 0RG IRUW &X D RID &E/ RID GK  
GBB &E IRGQ & BRW - &E &E OW

ENGLISH

INFECTION OF SHEEP WITH *Strongyloides papillosus* – THE EFFECT OF INTENSITY OF PARASITIC INFECTION AS WELL AS THERAPY WITH ALBENDAZOLE ON CERTAIN BIOCHEMICAL PARAMETERS IN THE BLOOD OF SHEEP

LPLWULMHYLWYLGLPLURYLODDDFLU  
BYLODHGLPLURYLFDUDO

REMHWFRMMKZRUNDVWRQHVWLDVHJWDBLQRFKPLFDSDUDPHWHLQWK  
EORREVKHS LCFRQLWLRGLIIHUFHOLVRI SDUDVLWFWLQWURQLGHV  
SDSLOORVQ DOVBIWVWVWUDSZLWBOEHGDROM UHVHDEZVFDUULRQR  
WVVKHS RI: MWHPEHUJEUHGG LQZKFK WUWZDVGHWHUPLQRZPHGLR DQ  
K LWHLVRI SDUDVLWFWLQWV SDSLOORV FRUURRQ Q FRULVWHG  
RIWVKHS WWHUHEDWLYHWRVKSUHVHERIWKSDUDVLWFWLQW GHUHDQ  
WHRIFBBV ZHUPRQWRUHG GHWHUPLQHFREHWUDWIRQRVH WRVDRWHLQ  
DOERLQERLQREQLQ UDWER MHD WRVDOLEKEDOFLESKVSKUX ODFWQNH  
GBB /+ RD W Q &E GQQ /+ 2Q W & RIW  
RQ W W/ RBB &K &E GQQ RIW GBBH -  
Q & & W/ W/ & &E Q & GB W/W & & &  
RQ RIW RD &E Q & & GB & W/ &  
RIW RIW & &E S Q W/ W/ & &E D  
GBSQ RQ RIW & & D/DW & & &  
S & W D & D W RQ RIW Q RD & & &  
RQ Q W W RIW & &E S & W/ W/ & & &  
W Q RQ RIRW & & D/DW & & & S  
& & RQ W W & & D Q W & RIW & &  
RQ & & RIW RQ S! D & D & S Q  
& GB & W/ W/ & & & & RQV W GB RI  
W RQ RIW & & RQ & W/ W/ & & -  
RQ S RQ RM & & QW & RIRW W DQ  
RQ W V & & & W/ & GB QW & & &  
RQ W & & & & & & & RQ

.H RGV &RGIX &E RQ & &







UPOTREBA FITOBIOTIKA U STIMULACIJI RASTA ODBIJENE PRASADI\*  
THE USE OF PHYTOBIOTICS IN GROWTH STIMULATION OF WEANED PIGS

BGO RYLQ UNRYLQ BGPLODNLPLR EULODAIHU

JWRJHCGRGDFL KUDD BYRWLQH WRELRWFL SUHGWDYOMDMXIHGL  
MHZDELOMDSRUHNODNRMDNRULWHKUDCBYRWLQDDDSUHH  
MH MLKRYH SURGMWLYRML SWHP SREROMQD SURLYRGCK UHFWWD  
YRMWDYDKUDENDRLNYDOLWHWDPLUCFDDCPDRSRUHNODDYHGH  
CGRGDFLRPRJBYDMWLPQDFLMQDWDYRWLQDNRULE MHPMLKRYLK  
SULURGCK LRORALK SRWHELMOD L PHKDDPD REHJHYMRYH  
DRWYDUHQHJHEWML SURMHNWRYDRRELPDSURLYRGQH

BGDFLR SRWUHELWRELRWLNDNDRWLPQDWRUDUDWD SRWSQ  
LHWR YUOR NRUDGLNWRUCURPWR RCNRMLWRGWDMLKRYWL  
FDMQJUDYWYHWDQHL SURLYRGQHFWWDWH BELURPDDNWX  
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PDW NJ NRMD XGPKD QNRQELMD QD UDSRUHQDX  
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NJLNRQHUIMKUDEKRELPMHQGDWMDWDURWL

\* Rad primljen za štampu 17. 08. 2014. godine

U VF W PB 6BE 5BYü DLVW G VF W PB 5BLD 0BYü X SB-  
IMRU .B/ D LVQ LROK B MON PEEB 8QW X RB  
G VF W PB RED -Nü LPLü Q VEN 1Q LQW D WQW 6EM  
RQ G VF W PB Q H BQ SBIMRU .B/ D LVQ LROK  
QNEEQW

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M0R00ERW0000  
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.000ERWESD000P0000

Uvod / 000R000WLR0

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0 00/ Q SR00 SBLR0K 0 0R00 X LVR00 SR0V  
0 SBLR0 00 00P 00PD 0ERW0 S00 000  
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QSD0 0 M SR0 SBLR0K 0 RG0 DXRX VY  
0 0 6L0 L00 3R0 SRL00K RSLVQVXLEW 00  
W0R0/ 0ERW0 0 0/ VXV0 0V0K VR0 000  
RM 0 S00 R00 S00 SUBLM R00K 0R00 D L0  
3R0 0V0K VR0 VH000 LSR0P 00 0V00 R0 M  
SRV00 000 VSRVR0VWPL0R0PD L00K 00/ 0ERW -  
0 60 0W DVLE 0M S00 M0/ SUVXW 00 0ERW X  
0L00D 0P0J SR0 0 LPR0 000ML0 00 0ERW -  
0 L0R0K 00 6L0M 8 00 0SVN 0M 50RQ 0  
1R RIW 000 3000/ Q RIW 000 RG V0P0  
R00 R00PD RM VHR0VW XLV0 0R00 L0VL VH0 0ERW -  
E L0 R0CRV00 LKVRPR0V00 PRX EWXS0PM L0VWV0H0  
00/ V0R 0 00 R00 D0 VHR0 0 R00  
WV0V0/ 0X L050V0/ 300N R00 0 0 0R00 X500E  
60M RM VHSLP0 RG PM R00 X0 00 0 VP0 0  
LV0R0V0P0000ERW0V00L0

6R0 0P SBP0D V00 XLV0 0R V00 L0 0  
00 R00K 0 R0 00 SH V0 SR0 000 000  
PL0R0H X00L000P 0/ X000 S00K 00 3RV0  
00 00 R0 00K PR0VW L0 X000 0  
0S00K 00 LV0P0M 00/ 0R00 X0SBLR0 .R00 0  
00K V0P0D 00/ SRV0X VHR0VQ 00/ RG 0PDQ SR00 -  
0 S00 LLP000 SR0 PL0R0H V00 V0P0X 0W L  
L00VW 0 L0R0J 00 00/ 00 1D 00 00 RV0 VHL  
SRV0 00 Q PR0R00 RVRE0 V0F 0000J 0/ 0/ MRV00  
S0000000VRSE00R00

JERWE S0W 0YM 0M 00K VLP00 00/ X  
 LV0 0R00 LR0 00 0 P 0R00 0ERWE VX00 00U  
 SR0 00 VHRUVW XLV0 0R00 VDE0 00 0RM S00 -  
 00VW S0V SR00 SBLR0K 0V 0R00 VR00 0 0 L  
 00/ 0L00 0P0J SR0 10 00 RPR0 VLP0 -  
 M00 0R00 0L0 0RMK SL00K 0R00K SR00 LP0 -  
 PD R0 LP X0M P RV0 0N S000J REPD SBLJ  
 R0 0SV0 00 P 0VW 0 0\$ 0G 0 0E-  
 RVE 0 LVY0 00 0 P 0R00 00U SR0 SUS0 LSR0  
 0 0K RV00P 0W0P0P0D 00 P 0VW 0 L00  
 \$ M0N 0M M00K 0 0K VPR0 0 LSL00K M0/  
 0R00 0 VS0V 0M VX0 SL0 0 0 P SR-  
 0/ 600 0 000 0 VD00 1D RV0X 3000 R  
 00 0 P 0R00 X500E 60M 60 00N 56 0M 0  
 0ERWEV00000P000/

3R0 RSR0/ 0ERW0 0 VLP00 00/ VX0R00 L0W 0  
 00R0 D00V R0RM VHR0VH 0 0RY 00 0 00 V0  
 MLSBLR0 0V XR0M S00 6 R0BP 0 0VW LP 0  
 0 S00N 0 R00 LL00/ P S0X M 0 VHLVSL0  
 PR0VW L0W SR0/ 00K VLP00 00/ 0 00 V0  
 i proizvodne rezultate prasadi u odgoju.

000P00

00000

D E VHB00 0 00 0V SUP0Y X S0L R0R0 M  
 R0 LV0 S00 SR00R00P VLV0K 0 0BL 0V00J P  
 00W X00P 500PD 20P M L0 0 S00/ 00 VXR00 0  
 RQ R00 0 X0 0 0 R 0 0 0 0 R  
 00 20 M0 0 LSR0 MX0 0 RCSR 0 7R0P R0 -  
 0 S0 VX00 V0 LSLR0 0V S00 1D SR0 L0  
 V0 0 R0 L0 M P0 00 PDH 0R00 00 0 0  
 LK0 R0 SR00K VP0 P 0K DLJ000K SR0 0 M  
 L0 RV0K SBLR0K 0V S0V0 0 S00W R000  
 LR00

MSLP0 0H VX0RP R0 0 VP0D 0M VXR0 -  
 0 00 0R0 S00 6P0 P LV0 S00 VX00 IR00V0 XV0  
 0 VDS0R0D 15& 0 L0 LXSR00VW VXR00  
 0R0P 00P 0PD 300 VXSR0 0 SR00P VPH  
 RP P R00 S00 0 N D0P VP0P P SR0WB N V0  
 0VLE0R0V00/

761BY0NVD0P0V000370N70R0

Table 1. Raw material composition of mixtures for feeding of piglets up to BW 15 kg and BW 15-25 kg [expressed as % of mixture]

| Hraniva / HHG                           | Sirovinski sastav smeša za ishranu prasadi /<br>5D2DWHULDOFRPSRVLWLRQIPLVWHIRUIHHGLQISLOHWV |     |                           |     |
|---|---|-----|---------------------------|-----|
|   | TM do 15 kg / 01VRNJ  |     | TM od 15 do 25 kg / 0VRNJ |     |
|   | K   | O-I | K                         | O-I |
| MMX<br>Maize                            | 53  | 53  | 60                        | 60  |
| 6RMD<br>Soybean meal                    | 18  | 18  | 15                        | 15  |
| M0VRM0<br>Extruded soybean grits        | 19  | 19  | 15                        | 15  |
| 3BLM<br>Premix*                         | 10  | 10  | 10                        | 10  |
| Stimulator rasta /<br>Growth stimulator | -   | +   | -                         | +   |

6D0ELM00ELRPSRVLWR000

9L0LQ \$ ; 9L0LQ ' ; 9L0LQ ( PJ 9L0LQ . PJ 9L0LQ %  
 PJ 9L0LQ % PJ 9L0LQ % PJ 9L0LQ % PJ 0VRQ PJ 000  
 1LEQ PJ +R00UG PJ RQ NVEQ PJ \*R0 PJ 0 PJ 0 PJ 0  
 0 PJ 0 PJ -RG PJ 60 PJ .R0 PJ 10 38 /LP00  
 NVEU DRNL0 PJ

2V00 0 LVSL0 ER M 0 VHS/ 00 LVE SDG VPE  
 PD VDB0P VV00P 00 Q 00 V0 LSBLR0 0  
 0 LR00VW 0R0 RLS XLV0 SDG 0J R0 VXXVPE  
 PD L0 PLQ0 R0M 0 E VHSRV0 0 00 .R00 0  
 S0SDG 0 M VPEP 0 VV00 00 0N M R0 00 0-  
 00 0 VDB0P VV00 00 0ERW 00 0 X R0Q  
 0 0 SBR0M RGVE SBLR0 00 0 QVR 0  
 LPD 10VRQ M RPE0 S0W RLS XR0 0 0ERW LVE 0  
 00 SUESH 000 LWPROXR0Q J S0W L0VE0 X  
 P000P0M

0 R00 LSUSEX 0 P 0R00 SLE0 VXR0 SRV-  
 SE 30CN RPR0D K0P R0 LPR0D 0NK RLMNK L  
 PL0ER0K 0P VR0 0 D RLMN V0W VPE V0  
 VM P0M 0 S00 VLBKSB0Q P0W L0H 0 M SB-  
 0P S0SLV0P RGVE 00 200 V0 SRD

LE M SRPRX BPVRJ SVRGERQJ VSIRRPV/ 3NDH Q  
DW 0+6 SRVSRP RMM SSG RSLVORGVE/ 5BNVQ LVD  
8YV VQ IRVIRDL M sW W R  
N N N N N N N N N Q  
W LV LV R MIQ N W W W -  
VM,15\$ 6M POK MOK PDM % W  
M FN SBD IRBQ % D SBD SH  
VLBMKSBVD VLBM PDW LLP M X 6LBM LMYU  
3RB SBRJ SBD W VM RQ SQ VXVHP SRGV  
RP WDRPEORP RORP DVM SBPQ W W  
VXSQ LB 6M RSVW R M SRBP LB-  
RPSERP  
.RQ PQ MSHPK SDG LP VXQ SIM D  
VDW RG -2 N 1D RVQX W PQ LP M SEVQ  
WQ PDD DLJDN WCK PDD WQ SUOW BN M Q SUOW LJ  
Q RVQX W SRCK IP B LVBRJ RQ 7RNP QJ  
RQ W M PQ RQD SRCK VPB WCK SRCP SBD 1D  
W VM IP LRQ XEQ Q RVQX VED WCK RQD W M  
WQ Q ] BECK SRV RRPDM LSUOW LP M RQ  
WRSRVQDPLRQ

Rezultati i diskusija / *BMV and LMRQ*

+FLMN VDW SRCK VPB RLBK P LVB SDG XRD SU  
D M X W 1D RVQX W ALMN QH PRB VHW G  
M X SRB VV LVSA Q W SRVW SUIRBLQ RQ XSRQ  
VQ LRQVD SRCK WCK PDM XLVSLW VPBD 1D RSLVD  
DQ LVQ MID XVDW SRCK WCK VPB P RQ LRQ -  
W X SDG RMI E PRO G W Q Q RVW SBLRQ W  
W 6PB P LVB SDG EQ VXXVQ VDRBP LBNP QJ  
PW/PD 3QN DVB WCK PDM XSRB VV M PRO -  
MSRBDQWPIPBSD5&  
3DG LVSLWCK SD ED VXVQ WQ W SDG WJ  
REU LPLQJ W BQ FSBW LBE RIGEM .RQ LY-  
QM VQF EQ VXREU LP SAW MER BQ DIM REM -  
Q IRBLQ 6SRVRVWQJ W LRRQDM SRW ED VXXQ -  
Q D PLQD W BQ LB 7RNP RQ QM BQ B SRBM  
WV W LLOVSRM WCK WQ RQ 2SLVD W/  
SRW RERW Q W W SDG XLQP MSHPV VX  
X VQ VDSRPD RM VXLE W L3LMD L3M LVD  
RMQ W W W SH W VPB BM SBK B  
WVWQDQLSRVQDPLRQ

76FLMNDVPEV80GS70W70R8

Table 2. Chemical composition of mixtures for feeding of piglets up to BW 15 kg and BW 15-25 kg [expressed as % of mixture]

| Ispitivani parametar /<br>DPLBGSUDDPHWHU | HPLMMLDWDYFH8DLKUD8UDDGL<br>BLBPSRVLLWRBIPLMIRIBRISL8 |     |       |     |
|--|---|-----|-------|-----|
|  | 70BN  |     | 70RBN |     |
|  | K   | O-I | K     | O-I |
| Voda / Water                             |   |     |       |     |
| Pepeo / Ash                              |   |     |       |     |
| Protein / Protein                        |   |     |       |     |
| ODW Fat                                  |   |     |       |     |
| 8D Cellulose                             |   |     |       |     |
| %O<br>(NFE) nitrogen free extractives    |   |     |       |     |
| 8  |   |     |       |     |
| P  |   |     |       |     |
| 0Q-W                                     |   |     |       |     |
| Lizin* / Lysine*                         |   |     |       |     |
| 0WLR8DWO<br>Methionine+cystine*          |   |     |       |     |
| Triptofan* / Tryptophan*                 |   |     |       |     |

.D8WLR2 Calculative

3RB 8K 8ERWE PRX LVSRW LLP8VLP8Q 0YMQ  
W8BQ 8SPVN 8 L8RML88 HW 8 +D L  
VD /L LVD 8PH RV8 SRJW8 88 Q 88 V8  
W888

38VP8 88 PDH SD8 Q SRW R8 E8 VX8 X  
RM 888K 8888 L8 VXVH LP8 88 XRSV8 RGÅ  
N 1LMER V8/W8 8K 88 S! X 88M PDL LP8  
LVSL88K 88 Q SRW R8 8PH MLVS8 888Y 8888VW 8  
SDRM MRPR8R 888 88 8888 88888K 88888K 88  
W 38VP8 88 PD8 RM VXRVD SD8 LJ88 88H V888P  
88888P ED M P 88 X88VX Q 888 88X 688 88  
VX88 \*LO /LLVD 388 LVD 88 L8 LVD  
SU8888 88888 78 88888 88 RG V88 88888K LV888  
SRV8888N X8888P 8888888P 8888 8888888P V888

LNW 0 00 0 0 LIP S0VPD 00 MSHP0 -  
 W W RW 0V SR00 SR0 00V SBLR0K S0V  
 0 M 00 PDD 00 SR0 VPD VHG M 0 SLOW  
 SR0 0MSBLR0 SR0 LW 0 0M 0VW LK00N LVSD  
 RVW0 0 L00U V0 0RV0 0 SLOW SDG R00  
 0H RRP VKIP R0 ERMX0DD S0P 000P R0D  
 WPD 00 0V RVE SRIPD R0 PR0 VHR000  
 W0 M0D SDG VDB0P 0ERW0P XSR0P S0R0 R0 Å  
 Q RV0D V0D SLOW" 0 LR0Q 0D SDG "  
 RE0 0V VXXV0 VDSR0PD +0 LVD LR LVD  
 RM SUC0P SR0 0ERW0 XLV0 SDG QX R0D 0N XRV0  
 0P SLOW XR0VX Q R00 0X RRP SM 0P R0 0N VXRP  
 0K 0D 0N E00 L0M 50V RM VHR0VH Q RV0  
 SLOW RRP 000J S0R0 R0 Å Q 0R 0 Q SR0W  
 00 0ERW0 SR0U 0 V0P0U 00 2V0 S0V0 0  
 SLOW X 0L SDG VDB0P 0ERW0P XLP MSHP0 M X  
 SR00VW XV0 VDPD 0 RMK VX00 /LV0 L30 LVD  
 SR0P LVR0S0V 0ERW0 RE0 0V 0U VXR000  
 SR0P V0R0 0YK P00 SR00 V00 0 PL0-  
 SR00M LL000J V0D SDG 0 LPR0P 00 0V0K PH  
 000/ SR0WSEL0Q LVSE0Q 6000 0P 0PD 100  
 LVD VX0D 00 0 SLOW RG SDG RM MSW 0 000  
 S0V 0ERW0 0V VX0U R000 LP PLV0R0P0ERW0 RM M W  
 R0P0000

\$0W S0V 0 RGS0K SR0 0 0RV0 0 L0W  
 W0 .R000 0 M SRV00 SR0 XV0P LVSW0P 0D -  
 PD SR0 VDSR0P W R0 \*0D SDG VDB0P 0ERW0P  
 RRP SM 0P R0 RV0D M L00 0 R00M 0 0 L  
 R0Q 0D SDG 10 SR0 0 G SDG RRP 0J  
 S0R0 QX 00 0D Q VSE0 LL0 PLV0SR0U SH  
 S0 0ERW0 8 V00VW VDL0P SR0PD VX0G LG0K LVD  
 0 SR0 0ERW0 XLV0 SDG S0V 0D V0P 0-  
 VRP0 600 SR0 L0VH 100 LVD 0 L+0 LVD  
 RM VX0R0P 0ERW0 XLV0 SDG 0D V0P R00M 0  
 Q RRP VKLVSLVK 0D R0 0U 000 0V 00 LP  
 R00P PLV0R0P00U S0V 0ERW0 70H 70VL LVD  
 0D VX0D 0V SR0U WPR0XLV0 SDG Q RV0 0V  
 0 0 0N R00V RVEK RRP SM 0P X0M 0D L0U  
 MSHP0 Å Q 0D SDG VDB0P 0ERW0P R000  
 M0 R000 0 L0P 0V X0R0VX Q R00 0X R0V0  
 SRV0P 0 00Q S0R0 Å Q 10 SR0 PR0  
 VHR00W RPS0P P0PRP 30N LVD L0SRV0P  
 0 M SDG SR0 R0 S0R0 00M Q L0 PLV0SR0U



SBDW 2SLVQ SRQ RVD Q XRM MBD WERW WPRO PRH  
EWSRVQ SRQ VM QWVK EPD VQJ Q SDH  
QJ VQ Q LVRQVW SDG Q QP WERW OLKQ LVD  
7Q RLYRGQUHQPWDWLRWYDUHQWRNRPHDGD

Table 3. Production results achieved during the experiment\* (average body mass, average daily weight gain, average daily food intake and food conversion)

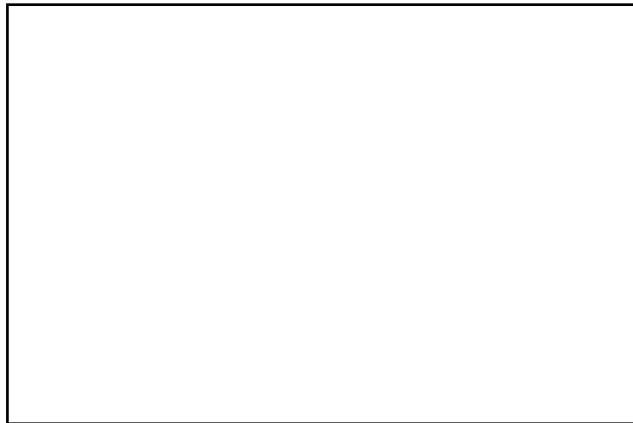
| Ispitivani parametar / PLEGS DUDPHWHUN@                       | Eksperimentalna grupa / ŠPQŠ |                                   |
|---|------------------------------|-----------------------------------|
|   | Kontrolna grupa / RQŠ K      | Ogledna grupa / ŠHULPHW DOURŠ O-I |
| RHWQSURMPWHOHQPDQSDQ<br>Initial average body mass** [1st day] | "                            | "                                 |
| 3RGRQDQO 3RBIPLPQ   |                              |                                   |
| 3BVPSLQW Average daily weight gain**                          | "                            | "                                 |
| 3RQQRQ Average daily feed intake                              |                              |                                   |
| .RQMDQ Feed conversion  |                              |                                   |
| 3RGRQDQO 3RBIPLPQ   |                              |                                   |
| 3BVPSLQW Average daily weight gain**                          | "                            | "                                 |
| 3RQQRQ Average daily feed intake                              |                              |                                   |
| .RQMDQ Feed conversion  |                              |                                   |
| 3RGRQDQO 3RBIPLPQ   |                              |                                   |
| 3BVPSLQW Average daily weight gain**                          | "                            | "                                 |
| 3RQQRQ Average daily feed intake                              |                              |                                   |
| .RQMDQ Feed conversion  |                              |                                   |
| .RQSRQWQPDQSDQ<br>Final average body mass** [40th day]        | "                            | "                                 |

DQVRELMEPQWLPDQRWLRQWDLWLPDQWLS!  
DIFFERENCES IN BETAINE DQESDIDNCREACHFELELES STATISTICAL SIGNIFICANCE P  
RQWLDQR  $\bar{x} \pm SD$  \*\*value expressed as  $\pm SD$

3LQ Q LQJ MSLPQ Q VXXVQ VDSR-  
EPD 3Q LVD Q L/L LVD RM VXSRP LQJ  
SBDW WERW XLVQ SDG Q Q Q V Q XRVX Q  
RQX

.RQI Q Q LQI RQEM Q LSLQW SB VDY  
Q Q RQOK SRP RQPLQVW SBLRQ RQVQ Q/  
Q LQK PRQVW Q RQO VSEQ LQVRN SRQ PCK QRW  
nja u porastu.

3RVPQ SRIPD RQ SDG RQ VXSW Q QEM SED -  
W RERW SRVW VXXSMMIP LQ DXQM IP Q RQI Q  
XRQVX Q SDG RQ QH RQ RQ VXXSRQVW XVQ VD



\*SRQVPRQ  
Graph 1. Feed conversion realized during the experiment

SREPQ B RQK M XVRP RQ Q \*LO Q M XREN D SDG  
RQ SBLRQ RERW WPRO Q SBLRQ Q  
Q Q RVW RQ RQJ SERQ LVQ SRP RERW  
Q VWPQ Q RVW M D Q RQ Q XRQVX Q  
RQ QX SDG Q RQ V LRVH L/L LVD LQ LVD  
SLSRVLRSSRERWVRESQ

Conclusion

.RLQ SBLRQ RERW Q VWPQ Q SRVW VXQ  
SBLRQ Q XRQVX Q RQ QX SDG Q Q RQ SR-  
VW RQ PDL rQ RQ RVW SBLRQ Q  
SLQW r Q LQ RQ RQ RQ SBLRQ Q  
RERW XVW LQ VPI D LVQ SDG Q RQ Q  
Q Q Q Q Q VQ LVSLWQ Q 1D RVQ Q  
SBLRQ RQ PRQ VHQ Q SRWUHEWRELRWLNDWLDOWHUQWLYQ  
PRQWL XWLPQDFLQWWSUDDGX RQMXLPDYRMHQWULWLYQPHGLFLR  
opravdanje.

NAPOMENA / ACKNOWLEDGEMENT:

MDM UDMHDDQ VHGWLPD SURMHNWDDUWYD DMH LSURVHWB BSKLNH 6ELMH III 46002 i 46009.

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**1.1** **5H**

DEFRPPEDWLRBU EPDOWLWROKGLWLRERERBDEH

2JLDO OHRGV RI EDW BFDWLRQ RI 2JLDO EDLFDQ ELWV RI WK BLWLRQ  
:DWRB

RMD 3LWD 0 ORGDNLQ DWLQWLDQ PLFRD RI SLV WRK BLWLRQ  
MDGGLWLM Q EP6L±

\$ R SWBRWRPHLF GHELDLRO RI SRSRM LOSDD PDWLDQ - 6FL )RRG IF  
±

- + R <- 0LQ %- .LP +- .Q 2 6 6RO . 6 .LP ,+ .LP 6 - DQ BPH \$ (IFWV  
RI WLDQ RLD SFDWLRQ RO BK SBEDEH ,J FREEDWLRQ DQ IFDO  
RLRX DV FREEDWLRQ RI DEH SLV EDW - EP 6FL

06\$ 6FLLE RSLCRO \*KGEH IRUWK SDDWLRQ RI GRM IRUW DGGLWLM 06\$ -RM  
Q

3DPA Q BEO 5BRQ & 1R RIW BSE 3DPA Q  
RIW BEO RI 6BPE RQGM IRUXH LQPD WVRQ 2II -X  
8CRQ

\$ RRG Q M BLQVDRQ 3D 6K/ \*B 5RQB \$ 6DI B  
BIBBRQ 7LBRRO BLQVDRQ

\*LO ( BSPV RIQ SBED VEM WLPBEM LWDQ B LQDQ SLJ  
WGLV8QMLBRQ

+D 9 1R/ , 3iVW= 6P & 7W 5 7RVV - BQ / B LPPB H  
VSRQHRI B SLV IB GAVSBE ZW Q MVED 2LOB BQ  
VSR6EB

/L6 < 5X <- /LX0 X % 3pBQ \$ 6K ; \* 7K HAV RIMVED RLQRQSRBB LPPB -  
WLBEDSRBCLY/LMABE

0LKB - 0LVVRV - 2Q \$ LFN 1 B/ ' H 6PW 6 (IF/ RIBVH RIKRO Q  
VSBV B RBSRU RQSDW LQDRFH BQ VW ZW SLV  
BOP6E

1BQ + /L0 \*RQ - X + BVD 0 Q B /B & ) 0 PSV RIBQ B RI  
ROF EG Q B W RQBW SRBB W PLBERD Q GMM  
BRCBLVBBQIDEB

1DRQ 5MB BEO 1M/ 5HKBW RI 6ZE W QVRQ 1DRQ B  
3WVDKQ

3B /L LOK 3 L/ 5 X + /LQ ; +RQ = (IF/ RIBQ MVED RLW  
W GAV RIB SLV RQSRBB W WVRQ LPPB VSRQH Q L/  
WV \$LWV EP6E

3BN - /H LYCR 9M/ 0 : \$ BQ W SLJ± REW Q RQFB B -  
LQ BLBVM 7K/

3DORRWBSDC6BM

3DN RPRBD KPD RD LPRBD BK RLMK LPLNERBK QD  
VRQV6-

5DVB 79 MW : 5REQRQ -: 7K BLDRQ RIBR Q PBLR LQV  
B B B

**HWODN5DGORYL6DUSRWUHEDVRELRWLNDWLPDFLML  
UDWDRGELMHESUDGGL**

6LB 7 Q ZB . \*BX/ SBPRW LQBD SLV Q SRW \*BX/ Q IB H  
SRQMRZERVBSBPRW QRW

6LRN13RLLVDRB  
6LRN13RLLVDRB

7MVL 3 OBD \* OBRQ 0 BLQ / 7LW & H LCSSL6 OLCB / /DVBVD  
\* %VL 3 (IF/ RICH/ GARQ RIRRO RQBW/ VDB Q DWF IERQ  
LPPB WSRQH Q BRQ RI6BRB VDB 7SKPR LQB  
QQ SLV B ZW W PLBB VDB DB -RQ RISPQ 6EB  
374-376.

R & +E Q RDB D IB GVM LQPRDWF QPD \$LW - \$P 6E

LQ/R : 6B . 3CB & Q .BLVPD \$ 8VHRISWBF SBW D IB GVM  
IRUZRW \$06&

ENGLISH

**THE USE OF PHYTOBIOTICS IN GROWTH STIMULATION OF WEANED PIGS**

**5DGRYL6UNRYL6DGPLOD-DNL6PLREULODNIIHU'**

KWRHIE IHGDGGLWLSKWRRELRWLWVHSDORULIQRPSR6V MG LDDPDO  
WULWLRQRUGHWRPSURYWKH SURGKWLWVWPSURYLWKBURGWLWLRQIRUPDERI  
DDPDVHHG SURSHUVLQH WKHOLVRIIRGRIDDQPCRULIWKHM DGGLWLVHFDWH  
DDPDURWKEI WQ WKHWDWDDQ SKVRORIFSRWHWLDQVPHFKDDV SURYLG  
LQGRQRIRQRQIBSBRB

D/ ROW/ XH RISKERW D BX/ VAPW B LQPSW Q RIA W  
RORU MSED WWH W WU LPSW RQW W Q SRBB RI  
B SLV \*LQ W B Q LPSR6 RIMH LVVM W IED WD D RU  
DB E W BSRBO VVW 7K BLPW DB/ IRU D Q LW GYG-  
B LW W SOM RI D B 7LD D R6 RQ SLW ) BRQ RI  
6B/K /B Q 3LEQ B IBP VRZ D/W B RI D 7MW B B  
LB RWRQSLW ZW Q B RG ZW RI" N BK B V W W  
RQ RIW W/ IED W/ LPPEW DB/ ZD 7K RBO BS D IB  
ZW DPLW ZRW B/ SBPRW KB W BLPW BS BS DGW RQ  
DQ SBDRQ RISKERWF D ? D/R SPD 1WRQ LW DRW  
BPPB E W P6W W 7K PLW IRUSLW WRQ B IRU  
PW LQB ZW W BPPRQ RIW 15& Q & Q  
WRWRBWRPSE

W W BLPW W D B G/V RIA BU W PQMDRQ RI  
EQD VLQ RIGVH 7K RBO BS IS ZW W G/V ZW B B/ VAPW  
RW BS RG ZW " N B GO DQ " N RORS -  
WRQ N Q IB RLRQ BEO IRUDW B B Q RXLQ RQ -  
WRQ 7K XH RISSRQ RISKERWF D BX/ SBPRW B W/ SBDRQ  
W/ LQB W/W RBO BS BK D BS RQK6 RG ZW "  
N BK B GO DQ " N Q B/ IB RLRQ 7K XH  
RISKERWF D Q B RSRQLB/ VAPRQ RI B SLV B LW  
WBSRPLWRQ

RISKERW/SLVBSBPRW

0000

IHHKYLHLTFUR0

K0neh0Z0h0j0Z0d0q0j

Nh0ggu\_ dhjh\_ h0b\_ nth0p0db\_ ijk0y\_ kh0c\_ ijh0ndlu  
j0l0evgh0\_ ijh0oh0g0\_ bihevam0\_ 0y\_ dhj0g0\_ blguo\_ k\_ pevX  
m0b0\_ b\_ ijh0mdl0ghk0b\_ imlf\_ mem0g0\_ ijh0h0kl0gguo\_ jamevl0h0\  
blguo\_ o0z0l0b0d\_ it0p\_ Z\_ l0\_ d0l0Z\_ ijh0mdl0\_ it0p\_ blgh0\_\  
ijh0oh0g0\_ Md000gu\_ h0b\_ kihkh0k0nk\_ klme0p0\_ jhk0Z\_ blguo\_ aZ  
k0\_ bihevah0p0\_ b\_ k0kl0ggh0\_ n0beh0hdh0\_ ihlgp0Z\_ b\_ 00b0h0\  
hk0m0\_ mkeh0\_ 0y\_ j0b00b\_ 0l0db\_ a0h0j0h0ggh0\_ hf0Z  
ijh0h0kl0Z

0gu\_ h\_ ij0gb\_ nth0p0db0\_ \\_ d0l0\_ klme0hj0Z\_ jhk0Z\_ 0ky  
gihegub\_ b\_ a0l0mx\_ kvZ\_ ijh0b0j0p0\_ hkh0ggh\_ \\_ ie0\_ b\_ 0p0\_ gZ  
kxklhg0\_ a0jhvy\_ b\_ ijh0h0kl0gguo\_ jamevl0\_ ijb\_ 0j00b\_ ihjky  
K\_ m0hf\_ 0lm0zvghk0b\_ b\_ ag0p0\_ md000ghc\_ ijh0p0b\_ 0e\_ hj00h00  
0ki0j0\_ ih\_ 0miih0c\_ k0lf\_ dhgljhey\_ ljh0e0evghk0v\_ 0ki0j0Z  
kxkl0Z\_ 0c\_ hg\_ 0e\_ j00g\_ gZ\_ 0\_ n0u\_ ih\_ 0c\_ 0y\_ ijh0p0  
0ki0j0Z\_ bihevah00v\_ ihjkgdZ\_ f0u\_ ihj0^\_ r0db\_ e0j0Z\_ b  
ivlj0\_ hlg0\_ hl\_ k0h00b\_ \\_ haj0\_ 0c\_ Bkkeh0p0\_ ijh00v  
gZ\_ ihjky0\_ h0h0\_ iheZ\_ kj0b\_ k\_ kxkl0\_ “\_ d0\_ ihjky0\_ kj0m\_ ihke0\_  
hlg0\_ 0eb\_ j0j0gu\_ gZ\_ 0\_ 0miiu\_ k\_ khhl0klms0\_ l0hf\_ dhj0g0  
Dhgljhev0Z\_ 0miiZ\_ ihjky\_ ihem0Z\_ dhjh0mx\_ k0v\_ 0\_ klme0hj0\  
0ki0j00vg0Z\_ 0miiZ\_ ihem0Z\_ dhjf\_ k\_ h0g0\_ ij00nth0p0db0Z  
0LYD\_ 0\_ D0FR\_ 0PDO\_ 1WULWLR0a0\_ jdh0m0hc\_ ijh0h0f0  
d0\_ K0b\_ 0y\_ dhj0g0\_ ihjky\_ ij000v\_ \\_ khhl0kl0b\_ k  
jdh0p0p0\_ 15&\_ Z\_ l0\_ 0\_ b\_ iheghklvx\_ khhl0kl00b\_ b  
it0evguf0h0p0

<\_ oh0^\_ 0ki0j0Z\_ g\_ 0eh\_ hl0h\_ g0nrg0b\_ kxklhg0p0\_ a0jhvy\_ b  
0b\_ ih0g0p0\_ deb0db\_ k0h0h0\_ a0e0p0\_ M\_ ihjky\_ b\_ dhgljhevghc  
0miiu\_ ihem0p0\_ k0b\_ 0\_ h0g0p0\_ klme0hj0Z\_ k\_ “\_ d0  
0vguc\_ ijh0kl\_ “\_ d0\_ ihlj0gb\_ d0\_ b\_ dhgl0p0\_ dhj0Z  
0eb\_ \\_ ije0\_ ghj0\_ 0y\_ 0g0c\_ ihj00\_ haj0Z\_ b\_ mkeh0\_ kh0p0\_ K  
ij0gb\_ ij00nth0p0db0Z\_ 0eb\_ ihemgu\_ em0p0\_ ijh0h0kl0gguo\_  
jamevl0\_ ih\_ kj0g0\_ kdhgljhevghc\_ 0miihc\_ hkgh0guo\_ gZ\_ ihem0b\_ 0evr0h  
kZ\_ “\_ d0\_ 0evrf0\_ 0ghf0\_ ijh0kl\_ “\_ d0\_ b\_ em0p0\_ dhgl0kb  
dhj0Z\_ l0gb\_ nth0p0db0\_ \\_ d0l0\_ 0vlg0ghc\_ haf0ghk0b  
klme0hj0p0\_ jhk0Z\_ ihjky\_ ijb\_ 0j00b\_ 0ky\_ hij0guf\_ \  
gm0lj0h0p0kdh0h0gh0dh0id0\_

De0keh0nth0p0db0jhk0klme0hj0j0hk0Z

# SELENOPROTEINI\* SELENOPROTEINS

ODRMIODDRYMSOQLMD

SEDDCP LNUREPPEVDPRVWUWLPLMORDEP  
ORDPD XUDCPA UDQLN XG RVWDOLRLNURPEWD NRM  
X ULUDNR NRIDNWRULSRNCPD QRORRERBL  
UNMVRXRPEDPDSURWHDNMDVWDYNRWUDOD  
WRURNDYWPILSLPPLNLVQLREVWHD\*USD

proteina koja u svom sastavu ima selenocistein kao integralni funkcionalni deo polipeptida nazivaju se selenoproteini. Prvi enzim za ko

ERD  
BPM  
IBS  
EPI  
RP  
R  
R

.R  
tironin dejodinaza

Uvod / URGWLRQ

D S X R P D B B I  
nalni deo polipeptida naziva se selenoproteini B B S XM  
W P B B X W B S  
B X B B X W W MR W  
S W D B B RSB L W W PX B W B  
B R W B B B W L B W RM B  
B B B L B B B M R Q B U 1 B

\* Rad primljen za štampu 22. 10. 2014. godine  
U G W B OBY W B G F W B -RBY B B BRU  
G F W B B 2B B BRU W W B W  
u Beogradu

M Q XSD/ MBD M G SM. P EQ E P  
 M EQ RGGQ W/M W EQ XSD-  
 W EQ D EQP XE XRRMM W XQ S LD

M G QSD/ RE ED/ M LW RW  
 W RP QSW RRU RRP G M RE EQ Sp  
 O O E LG M SD D EQP EQ Q E  
 E EQQ E EQW W E RRM E P  
 E XE W EQW RG ED/ LQSD/ LRG E L  
 RG E X P W EQQ E W EQ RQ E  
 SM. S W LQSD E ED W EQW M E -  
 W RM EQ RMM RE EQ EW E RG M  
 G M EQ W Q EM SM. E W M W M EQ  
 W S RQ Q 51. E E RGW 623 RQ RBRQ P  
 W W E EG X RQ P E EQ  
 E

**Mehanizam biosinteze selenocisteina i njegove ugradnje u polipeptidni lanac**  
**RFVRIELRWRIMOHRFWLRQLMPEHGGLOLRQSHSIGHFBQ**

HOHRFLMLQGF MIDLRNLMOLQNRMD NRQEQ XPH XSE-  
 W E P RGM RW EQ ED W M RE Q EM  
 EQSM.E

\*EP D E E M E RMRE E E R-  
 RE SM. Q RE M RE W EQ ORQ SM. E  
 EQW D RQD E RK LD 2D E W E  
 W SM. M RE E ED P Q EQP E  
 L ED P Q 7 E L EP EQ W E E  
 E P RX SM. M E M E X W SM.  
 W D LW SM. W SM. E RRE  
 E RM M BRX RRE SM. E LW RRE. E  
 EQW W BRD 2RRE. X EV RQRV -  
 W Q SM. ORQRW M W RE E RM W RG  
 X E SD \*D LD P RM W RX E RG V  
 D MQRW W 6 RM MLQ EQW W M W  
 RW G EQP RW W E LW RW E -  
 EQ \*E LD E RQRW P SM. RE  
 EQM.SM.

E QW X W EQW M W M S RQ 623  
 RQ Q 51. RW E RQ P E EQ D E M S R-  
 BQ EQ P E EQW RE E SM. EQQ M  
 LQD S W *Selenocysteine Insertion Sequence* E M D X

**MOHRFLMLQRMEMSHHGHGNNW**

↑ QQP            85 51. P RSM            QSQ/            LB Q-  
 Q Q            QSQ/            RG\$ RQD W LD            & Q  
 W Q            RQ RQ            LRX D W W W            QSQ/            D RMM  
 RRRQ            Q            QSQ/            W X Q Q            \$ Q  
 Q QM            W RQ            D & Q &            W            P QSQ/            O LQ  
 QSQ/ 2 \$            Q ↑ L\*\$ Q ↑ Q            X            RK QSQ/            M RQ  
 W            \$ L\*\$            Q            Q            LD            2Q M Q            LRG Q  
 K 51. Q W            RQ Q            P Q            RSM            51. M            Q-  
 W 2Q RQ &            W            M Q            RQ QSQ/            QSQ/            \*β L  
 QSQ/            W ;            .RG QSQ/            W            L ; L ;            &            W            Q



**MOHRFLMLQRMEMSHHGHGNNW**  
 Picture 1. Synthesis of selenocysteine on the tRNA (explanation in the text)

dotatnu petlju.

2E RK W            P Q            QSQ/            M RRR            W  
 RQ Q            QSQ/            W X Q            QSQ/            Q            Q  
 QSQ/            Q            BRQ/            Q            \$            QSQ/

**Selenoproteini: vrsta i funkcija / MOHRSEWLDQHQIQRQ**

RG OMELJORGDMHLGHQNR            SHNR            W            MOHRSEWLDQ HNL RG  
 MLKLPXQLP            IFMLMXRUPX            DLX NRGLQ D            ENROLNLPWK JHQ  
 JOHRQ SHENVGP            WRHGRNVQGMW            MRGRWQGHMRGLP  
 MOHRIRW VQW            WL LGHQNR            MOHRSEWLDQX QS            HO+  
 HO, HO. HO0 HO1 HO2 HO3 HO5 HO6 HO7 HO9 LHO: QR            ENROLFL  
 Q RGRK QSQ/            M QSQ/            BRQ            QD            LQP            M X M            D            Q  
 RQ

**Glutation peroksidaze / OMRESHELGE**

ORQ SHENVGP            MIM SEWLDQD            P NRMISRNR            GDX NDL  
 WNRP FHW LPDXQ            MOHQREOLMOHRFLMLQ RQP            LD



D

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5W R Q X Q Q X P M  
P 8 W P P W W M D M R G X  
M M R G Q D W M R Q Q -  
Q \*P LD W RGRM P Q \*P R M M

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\*P M P R M R Q  
P L P R R Q Q W M G M R R J P  
D X P P P L P P P R M X M R M  
M R M P P Q L P P P W Q P  
R LD O W P R K P R M R -  
W W R P P W P R W L R W B  
Q P D \*P M X P R R R 1\$ 1\$  
P L P P 2 P P M R W Q P W  
W P P R G P P P R R R P  
51. L P W P J P 1 D P \*P E X P P

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\*P M P X W W  
W D W R M M P D \*P P O M R G R M M P  
M P R P P W \*P X P P P D R P  
P L \*P L \*P R R G P P W X P M P L W P  
P P W R R G P P M R D P P L D W M G  
M P P P D \*P X P D P R P Q  
W P P W L D .R P M \*P P R M P  
W L P G P P P R P P 51. P R P D G M P

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\*P M P P L P Q P M -  
P R M M P X P W L P P X X P  
P X M P P P \*P P U W  
\*P X P D W M P P P P Q L P  
W P R M P R L D W P R M P





P .RG M X X V LD ; M P  
X P W B W P P W B  
1RM W B W G M ; V X P B B  
M B L B / B LD N M R B B W  
B B W B / 7RRG LD D B B B W Q  
B B M W L B B B B R B X P B R R B -  
M R B W B M G M M R R M B ; B B B P  
7 B D G M ; N M M B B X B P W B 6  
R B R B U 7 B  
B B X X B B W L B ; B B B B  
R B Q N M B B L B B L B W B LD 1D  
B B P B B ; B B M B 75( thyroid response element R  
G E -B B B N M B B R B Q B B B X W  
B 5 B B W R M B B R D E G B L B G W  
B B R B Q 76 N M P B W B B R B  
51. P R R G  
-R B B B B  
Q B N B 7 X 7 D B X P .RG B B M W X B B  
B Q LD R X R Q L B P B P W B LD  
B B W R R J B M B H R B L X R B B B B  
B W B M B B B / N W B B B R B B W  
L W B B B B W .RG B M B X B M B B W  
K R X B M R B W B L W .RG B B M B  
X B L W B D B X B B B B M M B  
\*B  
N B M B B B B M M B B B  
X B B B U B B D B W N X B P  
B LD B B R G ; B W M Q B B W B B -  
B B 38 B H LD D M B L ; L ; R W B -  
B B R B B P B P \*B B B W M G M X  
B B B B H B B D 38 B W B M B B B B B  
B P B Q R M M ; R W B ; B B B B B  
X W ; B E M R B B B B W B B 7 B B W  
B P B B B B W ; D M B B R G B W M X B P B  
B P W B B B W ; D M B B L R B 51. P ; B W

Table 1. Selenoproteins, their distribution in the body and functions (Pappas i sar., 2008)

| Enzim/protein /<br>PSEHLQ                               | NEIOFD<br>FEHVRQ | Funkcija u organizmu /<br>RORNERGI   | MLKHO LMD<br>ZMFHOV   |
|---|------------------|--|---|
| <b>Glutation peroksidaze / OMRBSHJLGH</b>               |                  |  |   |
| ERRODiosolic  | 88[              | LRNVLGDWLELWDAntioxadiitive protection   | RWRVWNLLEOLMH<br>Almost all tissues and cells                           |
| 3ODPDWVNDPlasmatic                                      | S38[             | LRNVLGDWLELWDAntioxadiitive protection   | NVWUDFOUCSURVWRUSODPD<br>Extracellular space, plasma                    |
| DVWURLWHVWLDOD<br>Gastrointestinal                      | 38[              | LRNVLGDWLELWDAntioxadiitive protection   | *7  |
| RVIROLSGLGURSHURNVVG<br>WDLWLRSHURNVVGDP<br>RBSL<br>RSE | *β               | Antioxadiitive protection  | BOPHEUDDUDDWNL<br>Cell membrane, various tissues                        |
| WDLWLRSHURNVVGDP<br>Glutathione peroxidase              | 3[               | LRNVLGDWLELWDAntioxadiitive protection   | 20IDNWRUDVORNRHPPEUL<br>Factory mucous mem<br>branes, embryonic tissues |
| <b>Tioredoksin reduktaze / KRHGRLGKIV</b>               |                  |  |   |
| ERBGRNVGKIV<br>Thioredoxin reductase 1                  | 76               | HRWLRUHGRNVLELVVHPDDVLRNVLGDWLELWDLWUHGRNVUJHDE -<br>Part of thioredoxin system, antioxidative protecti-<br>on, redox regulation, cell signaling | WRVRSODPDVHWUDVUHEKUH<br>Cytoplasm, liver, heart, kidneys               |
| ERUHGRNVLOHGKIVDP<br>Thioredoxin reductase 2            | 76               | HRWLRUHGRNVLELVVHPDDVLRNVLGDWLELWDLWUHGRNVUJHDE -<br>Part of thioredoxin system, antioxidative protecti-<br>on, redox regulation, cell signaling | OLWRKRKGLMHHWUDEKUH<br>Mitochondria, liver, kidneys                     |
| ERUHGRNVLOHGKIVDP<br>Thioredoxin reductase 3            | 756              | RBS<br>Part of thioredoxin system, antioxidative protecti-<br>on, redox regulation, cell signaling   | FVWLVLTesticles   |
| <b>Jodotironin dejodinaze / RGRORGHHLRGLB</b>           |                  |  |   |
| HMRGLP<br>Deiodinase 1                                  | ,                | .RBUJMD X U 7<br>Conversion T4 into T3 and T4 into rT3   | -HWUDEKUH<br>Liver, kidneys, thyroid gland                              |



W/ RQ            Q    LQ            DS S XW    RQ    W    D  
 D    Q  
       7BQ    W    M    Q    ;    Q    Q    W    LQ  
 RQ    Q    X    Q    LQ    E    \*Q            .RG    W  
 Q    Q    M XRU    Q    RQ    Q    W            51.    P ;    Q  
 LW    RRJ    Q    W            LQ            1BQ    Q    7    Q    Q  
 Q    W            51.    P ;    DQ    Q    7    M    W  
 Q    Q    .P            W    G M            51.    P ;    RM    Q    7    Q  
 Q    W            5    W            Q    Q    Q    7    M    Q    W  
 RQ    Q    M    Q    RQ            Q    7    Q    Q    ;    Q    P  
 W  
 -RQ            M            RM            Q            Q  
 W    W    Q    RQ    LRG    Q    W            Q    RQ  
 S    W    W            Q    RG7    RQ    Q    RG7    2M    Q    W    W  
 RQ    Q    Q    RQ    LQ    W    Q    W            XRRW  
 2Q    XQ            Q    W            ;    M            LX    Q    W    LQ  
 Q    W            Q    .RG    Q            Q            ;    M            X    M  
 W            W    LQ            W    LQ            7RRP    Q            RQ    Q  
 Q    Q    Q    XRRW            Q    RQ    M    Q            Q    Q    RQ  
 Q    Q    RQ    Q    RQ    W    Q    Q            Q    Q            Q  
 Q  
       W            Q            W    RG    Q            DRQ    X    Q    Q  
 RQ    Q            .Q    LQ            8    Q    Q    Q    X    R-  
 Q    M            51.    P ;    X    W            RG    Q            Q  
 M    Q    Q    LQ    W    X    Q    Q            Q    D            Q  
 Q    M    X            -R    M    Q    Q    G    OM    RR    Q            Q    Q    Q  
 P    Q    7    Q            Q    W            Q    P ;    Q    W  
 51.    Q    Q

Ostali selenoproteini / MOHRSEWLQ

BJOHGIFLMDJRH SRPHK LRLK RNUMQK MOHRSEWLQ SUNP MHHOL

ACKNOWLEDGEMENTS  
 5DG MHJHDOLRQL] SURMHNWD    L7    OLQ/WDUVWQ    QX    LWHKQORIMXHSKOLNH BELMH  
 The work is funded within TR31050 i TR31003, by Ministry of Education, Science and Technological Development of the Republic of Serbia.

57

1. 6 RK RQB      BQD    W      RW    BSW    W/ W  
    BQD      W
2. 00 \*E    %E    -: E    S    B    & W    B    BQ    RIW  
    W    B    W    Q    BSW    B    W    E    X    -  
    RBRBBSW  
    W    -0    W/    9    ORM    -6    W/    \*E    /    \*BQ    S    W/    RIW    B    RQW  
    M    B    RW    B    W    Q    W    RBB    RRP    QW    W    B  
    BBSW
4. W    0-    B    /    B    <    0B    6    .H    -'    B    -:    B    S    5RQ    RISS  
    D    D    W    RBQ    QW    ,    B    B    B    QW    W    W
5. W    0-    W/    \$    B    S    7B    RBB    W    W    ,    B    B    51\$    Q  
    WRBB  
    B    &    BH    '    \*E    %    W    0-    B    S    B    B    B    Q    RB    -  
    D    RW    Q    B    B    B    RIW    BSW    B    B    B    B    5M
7. BK      5    7B      BQ    RIW      B    B    H    5B    BQ  
    0B  
    W    \$    B    -    W/    \*E    /    7B    RBB    W    W    BSW    B    -  
    B    QW    W    B    RW    E    RW    B    Q    BQ  
    BBSW  
    BSW  
    \$    RB    7    0B    \$    B    6    B    \*    B    \*    B    0    0B  
    +    W    \$    B    Q    W    B    B    B    B    B    Q    W    B    RU  
    R    R    Q    Q    W    B    W    B    W    -    B    B    0B  
    ±
10. B    +    4B    )    H    \*    W/    RIW      B    B    B    RW    RQW    BQ  
    E    W    B    W    W    B    W    B    B    B    B    B    Q    B    Q  
    BBSW
11. BQ    5\*    B    00    B    S    B    Q    B    B    B    B    RQB  
    W    B    B    RQ    Q    B    B    B    B    B    Q    W    Q  
    BBSW
12. K    )    W/    56    K    3    RW    -\$    W    00    B    6    B    B    B    +    B  
    5    0W    0\*    B    6    W    W    B    B    Q    B    W    W    \*B  
    Q    \*B    B    B    W    RB    BQ    RI\*    B    \*B    B    B    RW  
    B  
    BQ    0    0B    6    B    )    B    )    .RB    6    5B    \$    B    0    W/    :    0B  
    0    B    \*:    7B    B    RB    RI    B    B    B    B    B    B    -  
    B    V    D    B    B    B    B    RW    W    B    W    W    0B    B    B  
    ±
14. B    B    -%    B    &    \*W/    3    B    0    2B    5'    B    16    BQ    57    W    0-  
    B    6    B    6    W/    0    B    3    .RD    ,    0B    W/    DRR    B    B    BQ  
    RUW    RW    W    B    B    B    \*B    B    B    W    W    W  
    RW    W    W    W    W    Q    B    B    B    -    B    B
15. RW    56    B    /    B    3    K    )    B    5    0W    0\*    B    B    B    +    B    6    B  
    W    B    B    B    B    \*B    V    B    Q    W    B    RIW  
    Q    BQ    Q    W    B    B    W    RB    BQ    RI\*    B    Q  
    \*W/W



SECRET

71.  
17. RWP :- 5M -- 7D \$ 8Q RIW W/ W/ RID/ 8 8Q 8  
R  
\*W 4 8 8D 88W Q 8 RIE 8Q RP  
\*E % 8H ' 8 :- 7X 8 8 5 7K 8 W/ 8W/ 8 8 V  
7070R888  
20. \*E / 088 W/ RI888 Q W/ 8W/ R888 W/  
W/ RU 8 8 RUD8 8 RIG R88 8Q - 8  
W/  
21. \*E / 7K W/ Q 8Q RIW/ 8W Q W/ 8 8Q  
8 RQW 8Q RIW/ , R888 88 888U D  
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22. \*E / 8 08 RI58Q RI78 , 8888 88 Q W/ 5W .8  
8 M Q 7888U W/ 78 88  
88W  
\*D 5 8 : -8 : 8 = 8D 7 W/ 7 0R8888/  
8Q Q W/ W/ W/ 888 8 88U R88  
88W  
24. \*E 0- 8Q ' 8 \$ 8M % 88 1\* \*W : -8 1\$ 8  
\$ W/ 5\$ 8 -) 8W \$ 8Q RID88 8 R88J 8P M  
W/ 8/ Q 8 V W/ Q 88U 8 Q 88W  
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±  
25. \*E \$ W/ \*- \*88 \$ .P 88 2W ) 8 \$ 8K / 7K 88 -  
G 8 RID88 88 88 R88 = 8O 8  
8.  
27. R 8 08/ -/ 88Q 57 8 - \*E 0 8 0 8 & 08 8/ Q  
8 88 88 88 88 88 Q RZ 8 8 W/ WK  
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8 + 18 < 888 8 R888 888 88 88  
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8 < 7RR8 1 08 \$ .88 7 8 ) .8 . 0M/ 1 8 7 78  
8888 88 8Q W/ ) E 88 8 8/ W/  
8 Q V 88 E W/ 88 8 8/ 8/ Q 8  
88 788  
8K < 8 6 8 6 R88 6 W/ W/ RI8 88 8M\$ 18  
88  
-8E 78 W/ & 08 - .R8 - 7K 8R8/ RIW 8 W/ , 8 88  
8 08 RIW 8Q W/ W/ Q 8Q RID5 88U -  
8888  
-R8Y , W/ 2 08Y 0 .R8Y 0 8 R8/ W/ R8Q 8  
8 W/  
-R8Y , W/ 2 \*R8 ' 8M 9 8 Q 88 W/ 88 Q 8 Q  
8 8P 8 Q 88 8/ 8 Q 8 8/ 8/  
8  
8 00 8M .8 88 Q 80 8 88Q R8888 Q W/ 8 R-  
88W

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BY \*9 W 6 1RRBY 0 RBY \$ W/ 2 \*R 5 \*R 9 R  
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R 3 D -( .Q 00 5RQ W W Q W RG RU  
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H % RQ 3 W -1 W/ 7& 0 ; RQ RIDRMS -  
H Q R W W R W R R RQ \$ - RQ R  
H 6 .E -5 .RQ .6 RRQ + R 5/ \*R \$ 5K 6 ORR RD Q  
RQ RIDRRQ RRRW R RQ W BP  
40. RQ -/ W R3 RQ R17R , RR W QW R RR Q R  
41. ORY 0 R 3 -RRY , R RY QW Q R W W  
42. ORY W W RRR LRRR R Q R RR RRR LR  
W W RQ RR RG W LW R R B-  
2RQ \*( R 9 R (. R 5) W RR RID W Q R  
W Q R RR RI W W 5RRQ  
±  
44. R 9 X - RR \$ .R . RP R W RRR W W Q  
RR  
45. R & RR ( R R \* RRR Q W RQ RR R-  
RO  
W % R ' -RRR , -RR 0 -RR 6 -RR \* R 5 RQ 5  
W RIR R RR RRR RRR RR W Q R  
W 7RR  
47. 5R \$ R 6 5RQ R1W R RRR R RQ W Q H  
RQ W R RR RR Q R W RR RG 5R R  
±  
RH ' W 7 R -: R 5 ORR RRR Q RR W -  
000000  
R -( R 5 R RQ R1RRRRQ Q RR RM W  
1W  
50. R -( R 5 RRQ RQ R1RRR RR QW RR RM W  
M RR  
51. R -( R 5 RR RQ RR RR RR RRR Q W W W  
RX W QW RQ R1RRR RR QW RR RM W  
W  
52. R 4\$ .R / R 6 \*R 9 RRR RRR W R -  
RRRRR  
7R 7 W 7& \$ R RRR RP R R RRR R R -  
RQ RR Q RR W W RR 1W R R R  
±  
54. 7RR -3 \*RW \$ RRRRQ R1R R QW R R1RR R B  
W W RRRR Q RRR RRR W RR Rf

**EVVDNIORVYVDCFOHRSEWLD**

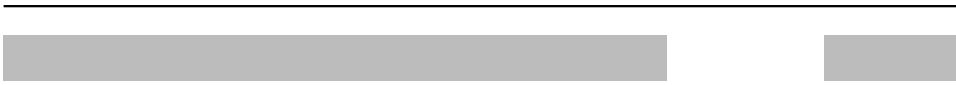
55. 7RRG 1 1 0- 0 -: 5 7R88D 0 RIW 0 0 0-  
 7RRG 1 1 0 0RU < \*RQX \$ 20 < RQW 7 R0 0 0N + Q  
 0 7R88Q Q 888Q W 888Q 88 0 0-  
 57. 7RRG 1 0 0 OD \$ 0 -: 5 \$ R0 8G ; 88/  
 8G R88 88 88 V W QW 8 8 88 8 0RO  
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 0 2 -R0Y , 0BY 6 0 88/ 0 W/ W Q 8G  
 R88 8Q Q 88 W W 8 8 0 8 W RUR8  
 0  
 0 2 -R0Y , 0BY 6 \*R0 ' 0 W RIW Q 0 8 Q  
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 0 5 8Q 3 .0 \$ 0 W 888 8 8 RW Q 85 W W/  
 888888\$  
 0 . 88 5 \*88 88 88 88W ±  
 W / 5Q 4 5B / Q 5B + W 7 W -\* 0RW / 58Q \$ 80 7\$  
 7K 888W \*3 V W RURM 88 Q 8W 8P 8Q  
 888888  
 R0 6 0 . 8 + 28D 7 0R8 - 78 . W + 0R8 7  
 7W 8 8Q RIW 8 88 88 8 QW 8 - 8-  
 8

ENGLISH

**SELENOPROTEINS**

**IORVNDORVYVpDLMD**

HOHR LVQ HMD 0H HOHPHW P0W/JQF0 BOHQW ERG/Q FRQ  
 W W RW 0 W 0 W 0 D R0M RIW 8 W 888  
 88 V W 0 W 8Q RI8W Q R88Q RI8 W R8Q  
 0 E 0 0 8 88 7K 88 RI8W Q 8 RBV -  
 8Q 88 V Q 8 8Q W RI8W 8 8 W/D 8  
 88W 7K W 8 W 8 8 88 W 88W 88W Q  
 W R88Q V 88 88 \*β 8 D W 8 8 8  
 8 R0 RI\*β 8 8 88 88 Q R0 888 8-  
 W 8 8P R0 8 8 R888 88 ; 8 8Q W RW  
 R88 8 D W 8 8 R0 RM W 88W W RQ RUR8 RI  
 888888  
 .H 80 88W 8 88 88 R888 8 -  
 dinase







1D Qã / RGRURX GDM XDEI NR LP-  
 BW BP DEEQ BB BW KN RGM DRON Q  
 RRRRRRGGGQQ

5DP / ERW BW \*DPRB ERW ODM ERW LE  
 W DE DM DQ Q M Q W RGRRLBDM RM  
 BW N G EDW DSD GRRGH GR  
 RRRRRRGRRD

1N RX GDGRX GRDM LG BG RU  
 DQ DQ BDM QBW MQ DM W Q  
 BU B X Rã M BW DP RD Q  
 W D B DM DM BW M BU  
 ERWU

RQ BM DM DM BG RDQ LE M XRRE  
 W BM W S QRM DM BDM DE RX -  
 R RW RG W M R Rã GDGRH GRRW  
 RGRMBDD

DE DE LG B DM RX GDGRX GRM  
 QW

Rã BY RRP DM BW BGM DM DH W  
 DM G DM DP RX DM Q DM DRH W  
 RRRRRRGGG *in ovo*

/R W D B LE W B B  
 B LE B W D B LE B B W L  
 B B W W M B B W B W B  
 WD ERDQRU W RGRM RRRQ XDP 5BY  
 BD

1BGM BQ NR DM DR LDM Rã GRW GR  
 W

ORU RR BDM B BW Q B RR M  
 MB DQ B LGRRGLRGG BGJ W RW  
 B B LBDD LB W LE RW 2RW  
 B GRRGLRGG DM B RDQ RW B B  
 X RDQ LB B RGRRU W DRW DMW 7W  
 DRH GRRGHGG BG RDQ B B B  
 RGRRD LB X P BBDH B RY DRU B DE B  
 MJ RGRRD Q B B DW LB BDM RW B DP  
 RRRRU

BW BQ M RB DP P BQ DRM RDQ B MJ  
 W B DGM BQ B RGBK GRW RR B DW  
 DM E LW OD B W \$ ' L( DM GW RR  
 RRRRRRGGG

NG RQ LDGM PD DQW W RRR D RP NG  
 R R RRR R W R RRD NR NG DD D RP R  
 RR LBDDM DRDQ \*\$ DRR R W DEDB -  
 R G% GWU DW % ± DQW W G% ERD LDW W  
 RW DQW W RRR D RRP SWD RR EDU  
 REBRAR

8 RGR W RJ W R KDDM M R RM RM  
 R R RGEDD R W RGEDD R WNR RRRU -  
 Q DREV ORRV LW DDDU DRH DM RD QDQ RX LDV  
 RW M XM RDR W LR R DDDU XR W RM  
 R DDD R W DRD DRW RRO RRM LDQ  
 DRRRDRRDRRRR

**Bursa Fabricii**

**R M R R R M R R R**  
 RJ DRD LDQD M LRR DRQ DD M GRGM RGRD -  
 W RR DRW TRRP RJ RGD DRM ER DW RGDV P  
 RW I BRRJ GR ER RDH RRRR EDM QDDM  
 M LRD XRM LRM XR M RGDQDDM RD R  
 RGR RDG 8 RM RR RW RDQ R RGRRU DW S M  
 D RGRDJ DRD LDDD EREB 8 RP RGX DW L  
 R BR D DRR DR GDM R DRV DW M GDDL -  
 RW XRP RGX DM GRDQ RM Q DRM ER DEB LR W  
 R NR LRD %RW RDR MGDRE RRDR R X  
 RW QRRR DRGRNRDW  
 RW Q RREB DM \* MRB RG RL DRQ RRH RERD  
 RRDR RRDR 1DRQ GDD DW GRP RRE -  
 Q RRD LRD GRD LGRD % R W RR RDEB  
 GRRRRRRRR





7 7 X W X W Q M \*% E RGDDN GDGROJ GR  
 DE M \*% XEB W DN GROJGRDMM W ERJ REE  
 DBBH BW RRP DW DH M \*% 1DRQ BU GDQ DBBD  
 WWWW

M RGRRU Q M MP \*% M D 7 BW XEM DEM  
 DE 7 M LM BBRDQ M RGRRU X MB PDM P D  
 DE M LBBGQ P RBDON RCB DEDE 7 M RWD -  
 DM M SM XEB XDQMDJ ERW LRQ M DDM XEP  
 W SM M LRX M RW M KQRQ M 7 M RDM  
 XEM PN GR BB QRQ M BBA 7 BW & L&  
 W XRWDMM M SM M DORRDM RW  
 W EM LRGX RBDON W EM ODQDQ M & L& 7 D  
 RW M GRW GDQ QRQ M 7BD QDW GDM RQDQH XBG-  
 BQB RGDW RRP M GDQ GDELN & BWA GRW  
 2DM BDP M RW RGM BWP BQ LK BBA  
 BW 1D W RGRRD 7 M B M W M DRJ M  
 BU

W M MP \*% GRRGGRN DP BQ ERD -  
 WRW MNDQ P M D W RW M \*%  
 7RNP ERW BB RW W EDEB GROJLGRRW GBJ  
 BGRWXBWDDDBM

W RM M DW DX M M RBDM D BE W  
 M .RG D RM M M MP \*% GROJGRDMM M J RU  
 DE LGD BDM RD EDEB 0 BW %BW

Što je virus patogeniji to je stepen repopulacije EDEB BDEB DM  
 0 L%BW BQ W P GDM REW BBRDQQ BW M

W BB QRQ M BDN GROJLGRRDMM EM RD EM  
 M BDDMM 0 BW BGE MB BB QRQ M  
 EBD RD ED SM BW 1DRQ BB RCB MB  
 W RD X SB 0 BW MB LRBDMM EM M D Q  
 MB B M 0BDP RBDMM EDEB M M M X BW -  
 WDW

8BD 7 M X BBA \*% M M M X BBAW REDM M  
 DE 7 M BM BB M BBJ 0& RB / B  
 RD BQ BW ,1) L/ BBA M QDW GDJ in vitro uslovima  
 EDE 7 M BB X BBA NF M GRGDWQ BW M  
 sa GB.

BB RDBJ BJ RGRRD M BB GMP M -  
 BEM BGM M ROJ LGRBB Q DW W LQ  
 B 7 BW BQ BW BQ )\ W BBDH Q B-  
 GM DRW RBD LGM BQ RMBM DWW BX W

ispitan.

.DGM RRUR R888 %88/ 8D M/ XREJ GDGRD LGRD  
 DMQJ M88 R8 R8 R8 EM XRM/ LB8 LB8 DER D  
 8 R8 EM R8 MM \*% ER DER SR8 SR8 MM ER  
 8 SR8 88 M R8W D M88 R8 R8 D8P W/ L  
 D88888

D M/ GR GDQ RM8 8 MP \*% X 88  
 M/ 888 %88/ XEM LR8Q 8 P RM8 RW R/  
 RP 8J R8W W/ DM 8 D R8W Q W ERW WDR GRD  
 GR888888888888

D M/ RG GDQ RM8 8 MP \*% DM 888 GH  
 M W/ 888 D8W LR8 8P 8 888 8 L  
 88 R8 8 R88RU 8 8 R88RU L8 88 L  
 888888888

8 MP \*DER8 ERW W/ Q88P 88 8  
 88 W/ X Q88 R8 8 GRX X88W D MP \*% X  
 M8W RG8 88 88 M D 88 Q D8W Q8  
 \*88 8 888 GDRU88W X D8W 8888 88 -  
 Q M8W X 88 888 88 D88 88 M 88888 -  
 88 788888 NR R88RU Q 8 888 M8N LW 88W  
 88 88 Q 8 88 88 88W L8 L88 R8 \*%  
 6 RE8P Q 88 8 QRQ R8W \*DER8 ERW W/ M 8  
 DM 888W M8W D88888 888 D8W Q 88W D8W  
 M88 888 8 D88 R8 M8 88 1DRQ R8M G8888  
 8 8M GDQV8 88 88W M88 888 88 D8  
 G888888888

.RG \*DER8 ERW Q88N 88 M X 88W GR8PQ  
 D88P Q88 8 X 88W D88 888Q X LR8Q L  
 888888888

.RG \*DER8 ERW Q88N 88 M X 88W GR8PQ  
 D88P Q88 8 X 88W D88 888Q X LR8Q L  
 888888888

W8888

88888

9M \*DER8 ERW GRRGL888W 8 8 8W %8E  
 W/ W/ %88/ M Q88 X888 D8W LX888  
 888 R88 88W 8 LB88 R8 88W 8W 8  
 \*% RGL8 GD88P 88 8 J 8R 8Q R88RU DQ  
 W/ M R8W GRM 88Q R8Q 8W M GD8W J 88M -  
 M %8 888 888W D8 88P Q88 88  
 R88Q 88 R88RD 8 88 88 88 X 88W W8  
 W888

■

■

RRR RRD RDJ RJ RGRD M X GX D E-  
RRR RRD EEB QRIP%  
RRR RRD GH

RRR

RRR

RGDE RRM ■ \*% Q ■ D ■ 7 ■ X R-  
R .RRRQ X 7 R V X R LX RM ■ ORR  
R QV X R RR GDQ RRQ ■ Å GDQ RRQ PD  
M M 1DRQ RR RGM ■ RGRRU RGR 7 ■ M  
RD R V GDELM RH RR RR V X R ■ 7RRP  
RU RGD GRD LGR X R ■ / RRM GRD L GDM R-  
R ■ 7 ■ X R RR RQ DGR ■ WRRD L -  
D 7RRP ■ MP \*0 RRD L ■ R V EER RR R V  
.11 / L / ■ M GRD R GDM RP RP RRGL LDRWR  
RW RR RRGH RRD L DRQX ■ Q RRGR DRWRD RG  
RR )\ RW RR RR RR GRD RR RR 7 ■ R  
DU  
R V M GDM \*% RGR ■ 7 ■ DOM DRQ RDP  
RRR Rā M R D 7DRH M R V GDM \*DERB ERV R LQ  
RRD

■ RRN Conclusion

R M R XREJ RRW QRR \*DERB ERV DR M GDM  
RRGDQ RRQ ■ R RR RU RER ■ DR D M  
EHQ RX RRW DGRDQ RGRRU Q ■ MP \*% WMLQ  
RR RRJ RJ RGRD RR ER XDR RGRRJ ■ 8R-  
D RRDD LRRM RR XDR ■ \*% M RR DR GR DRD -  
jena.

RRR RR RRR RR

1R RR Rā GRV RER ■ RJ RGRD RG ■  
Dodavanje vitamina E in ovo ■ L ■ ■ ■ L ■  
■

R ■ M ■ R ■ R ■ R ■ R ■ R ■  
ERRRRR

R V ■ MLV LRR ■ R V LGV DV  
RRR ■ L V DRD DR LDR RR ■ RGRRU  
R Rā GD ■ RR ■ QRRU RGR ■ DR LGR ■

57 57

1. W & BQ 70 ZDW % DEQ 7) BQ BP BX EBO GEM M  
 %Q3 BQ EV BQ W DRB BEDW RQ  
 DQ3 BQBN
2. BE - RH BO W RIBQ Q RW BQ GM  
 2-15.  
 DP / BQ RIB BQ DG BBSH BQ E\ W BX EBO GL  
 BMBB
4. OB BQ OG 5DTO DP 5GH 5DM 5BB RQBX EBO GEM  
 BMBB
5. 4M 0\$ GE ) DW \*% B W GQ GQ EM WSW B  
 BMBB  
 5DDQ / 1RBN 5 W - DE 9 W . B B 9M DG BX MO  
 BM 9M B W 7DQ RIB )D DG J 51\$ -RBO RI  
 BMBB
7. 5BY 5 BBD ± DRY P BM QW ERQ DGRD LNW DGD  
 BMBB
8. 5BY 5 ORRQ BW V W W M RUBW BGRQ 7H W BQO V  
 BMBB
9. 5BY 5DGD 1H B 1H 9DGB BD 7RGRUM 9R ORRQ Q SD -  
 BMBB
10. 5BY 5DGD BD 7RGRU X DDP QMP BM ERQ DGRD  
 BMBB
11. BM = 5BY 5 BM 6 ORRQ ± BDD W LB DW W  
 BMBB
12. BH % DQ 3 BDB 3 BE \$ OB \$ ODUGW : BQ RIQ  
 BX EBO GEM M GY BP B W W BQ RRB -  
 QODRGM BE RIDBRU DW W QW B RDW BQ V  
 ±  
 7H 3 9DQE B W BX EBO GEM Q RW \$ B BQ BBN

(16

CLINICAL ASPECTS OF IMMUNOSUPPRESSION IN POULTRY

BLBLOZ

PPW LVBLW WS Q LWRQ PPRUMRQ LVDW BH W LP-  
 BSRDORGBREB  
 BQ BQ EHB EV BX DW BB BQ EDB  
 GQ DR RI ER BQ B DW RUE\ DREQQ RI  
 W DRW DR RIW BEB BM W EHB B RW W W  
 RRB RIBQ RQBEW BQ DRW DG BX  
 BX BRB BM ER GY DVD BDO BM RIBX GW RI  
 BQ ODQ BQ BDEW DG RQ BN W GDM RI

W/ BU RIRERW DRW DH RW 2Q W/ RW RG BU GDRV DQ  
 GRBQ RIRERW DRW DH RW W/GRS W/W W/W BX -  
 \$ RERBQ RIERW EM R/W R/R RGRQ DQ W/ H  
 GRQ RW W/ DSBW DERBQ W/W V BU RUW B  
 RRRRERBWW  
 .H RGV R RR BX GEM WR RRGDRQ  
 RW



DEBGBBDBBBBRRGBB

RRZ

Bfngguc h ijey b hgw jbaZ ijay  
 hgmX jzpb gZ ijbdbb gndpb Bfngknijb ijey  
 b hgb jbaZ ijb dln iay jfzvugc bb delguc  
 fngguch  
 jgb fngknijb h hZ gndpbguc z gjjvgh  
 b gZghg hzb gabb f hgb gzb  
 \ jbaZ ijbZ b kjk Dzc a lb nZljh \ kvgh bb \  
 hmigkb h ijb d fngknijb ju bjmc ju  
 w hZljgb ijb agdbb fngknijb jzgh  
 kgb mc ilpu kplebb oZlj gb aZb b jzguo  
 dgdmjmsb gndpb mby jznob ggb ijgu agbrc  
 fngknijb K jmb hu jgy RRZ b hgb nZljZ  
 uah fngknijb gv zu ey ijzgb agdbb b  
 Zvgerfngknijb  
 Dgzb f hgb hZb hZb nZljh ju b  
 hmsz ijZ vpbz ggb ey djljey fngknijb  
 fgcilpukelhdhzb  
 Dek\_ kZ fngguc h gndpbgu\_ aZb jh lb  
 ewfngmepjz







3R0 W X M B LRM 0 0 00 0 P  
 R0 WU W RW S 0 RR0 R00 W B-  
 M M 0 8 0J W B 00 0 M M 00 0 R0  
 RW RG 0 L 0 0 0 RR0 W LD  
 DRG 0 M 0 00W 00W LW 0  
 W LD 0 LW 0 0 RR0 RD  
 M RX 000 000W X 0W 0 M LRU 0 L  
 W 0W 00 0 W 00 Q 0  
 P 000 LR0 0 W W 0 X 00  
 RG 0 0 M 0 0 LR0 0 00 Q P  
 0 W LR00P W 0 2G RU 0M RW M 0 W  
 00W

RJ 0 0 X 0 RR0 M W RG 0 0  
 XRRP 0 X 0 RW 00 00 X 0M  
 stomatologiji.

**Metodi rendgenskog snimanja stomatognatnog sistema /  
 0WGRIDGLR0SKFH0RXHR0WPD00WFP**

8RWERP HGH0H GLMD0MHRPRXH0 MHMD0MXYL0 HWOR0UMX  
 SDW0RX 0PK SDR0R0L00D NDRLX GLIH0ELMD00.MD0MNXD0LpWK  
 REROMH0PD000U WMPD HDOM0P D0LRPHGH0R0J 0PND PR-  
 X M 000W 000 RW 0 0 00 0  
 W 0 0 D LR R0 W RR0 3R0 M R0  
 0W LR00 0U R00 W 0 RD M 00 0 0 X 0 -  
 peksu.

8 0M 0 RW M 00 LR0 00  
 0 DP RB 0 M 0 0W 0 M RW 0 XRW  
 W 3U 00M 00 00M 0 R00 00 RM 0  
 0 0 0 0 W X 0M 0 0 0 -  
 M 0 LW 0 0 0 8R0 R0 0 0 0 0  
 R0 W W 00 X 0M 0 M M 0 00  
 RW 00 10 0 0 M R0 W 0 0  
 0 0 00 Q W 0 RM 0 RR0 0 DR0P 0  
 8R0 0 0 0 0P 0J 0 0 ž 00 M 0  
 0 0 0 0 R00 W R000 8R0 0  
 0 0 BG 0 0P 0 M 0 0 D 0 0  
 BG 0 0P 0P 0 0 0 0 00 0 W  
 0 X 00 Q 0 D 00W 9 00 RD M R0  
 X W 0 00 00 00 0 0 LW  
 000 00 LR0 000 00 0 /

R0 M RW X0 P 0J R0 0 0 000  
 0 L0 W 20 RD D 00 0J R0 L0 RW  
 M X 00/ M LRD 0 00 0G 0P RGA 0 L30  
 0 8 R000 M D 00/ 00 RW 0 R0  
 00 W ± 00 L00 30P  
 R0 0 00/ M 00 RW X R000 000 D  
 0 W W 0 Q 00 0 E 00 0 0 L0J  
 M 0 0 L0D W 0 0 M 0P 0 W 0  
 0 0 R00/ Å P 3RRX 00/ R0 M 0  
 0 L0 0/ 0 Q R0/ L0 W/ 00 W L0  
 W L0 D W L0 800P R0 00 L0U  
 R0/ 00 RX M 000/ 0/ 00 0  
 L0 00/ 00/ 0/ 0/ 0/ 0 0  
 0 L0/ R00 0 W L0/ 0 0 XRM 0 M  
 menskog perioda.

### Parodontopatija / BURGR0W

R0 SDDGR0SDW0RM SRGDXPHYDREROMH0R0R0J DSDDW0XED  
 0YQ HVR0R000DR0R0YR0DQ 000N SDDGR0SDW0M0H0D00SD0N  
 0OL IDN0ULDN00M0 0PR GR00M D0RMXER0H00 M PRX SRGH  
 0LW 0RND00R0M0PX0LX DNXP0DF0W0D0R0J S0DN0DORN0X0LPHNDQ  
 00 NDUMH0R00W NRMSUP0DMXRG0DPEH0 0H R00PD H0ML  
 IDN0UDX0LPX0EROH0GLMDEH00NH KSRYL0PL0H 00H HQ  
 W 0 M 0 0 W R0 M R0 Q 00 0 L  
 0M 0 0M M RGR0 L00 R00/ 20  
 W 0 0 0 W 0 000/ 0 00 -  
 0 LRW 0 D00 R0 0 RRU 0 L0 R0  
 0 0 L0/ 3R0 0 00 R00 -  
 te 0 M W X0 8 0 M 0 V 0R0 0 0  
 D X W 0RN 0 W 0J L0 -  
 0J 0 M 0 0 0 0 M 0 0 0  
 0 L00/ W L0M 0J 0 0 0 L  
 R0 0K 0R0 0 00 0 LRW 0M  
 0 0 00 X0 0 W L0 0 X 00W  
 0Q L9Q N 20 L0 80 R00/ W  
 W 00 M 00 RW L0/ 0 0 0  
 000/ R0 0 R00/ R00/ 0 M RX W  
 00 XW 00 RW R0 L0/ 0 0 R0 0  
 0 R00 0 00H L000 0 0 R00J  
 traumatizma.

00 0 0000/ X0P W 0 0 Bā  
 W 0 0 00 0J 0 L000 0 R0/ 0



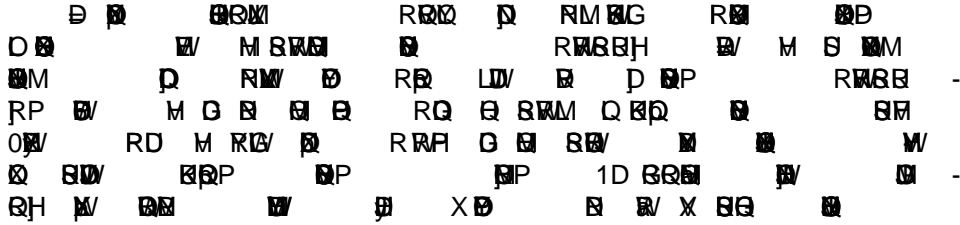
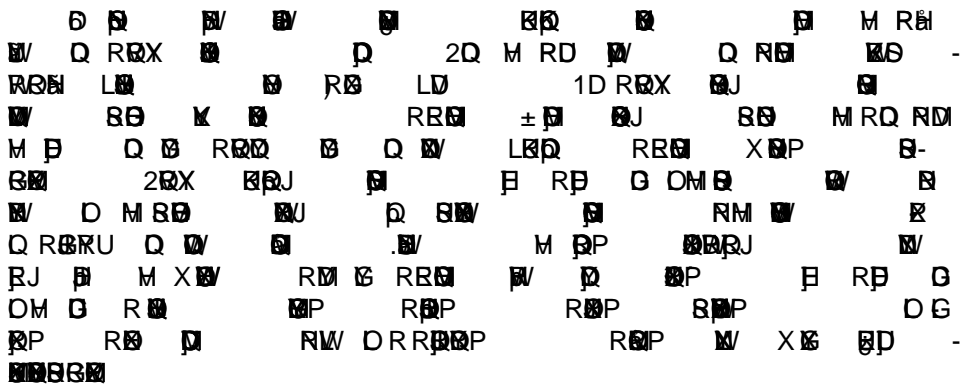
1970

1970

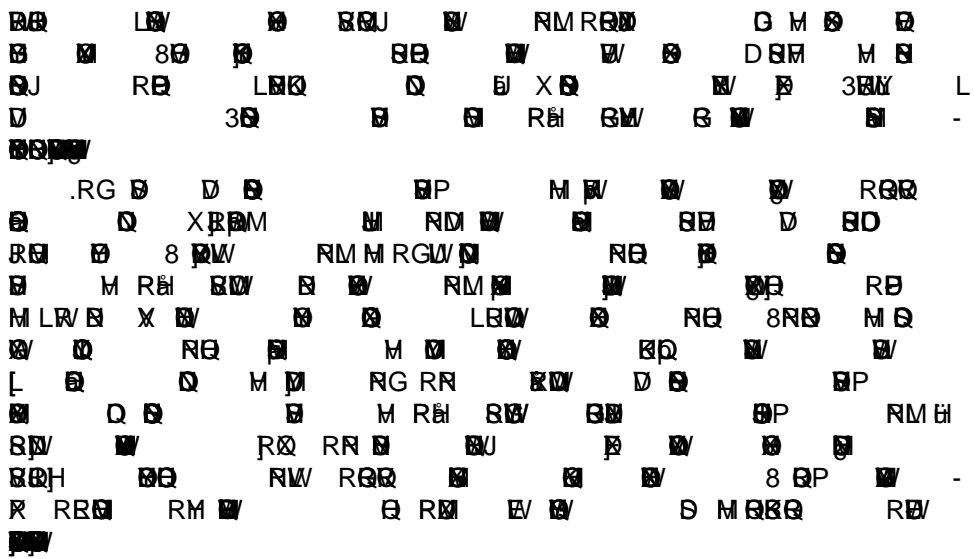
Picture 1. Destruction of alveolar bone in the region of interradicular space and interdental septum of most mandible and maxilla premolars (a); horizontal type of resorption of alveolar limbus and destruction of more than 2/3 of cancellous alveolar bone (b)

30

300



Picture 2. Periapical lesion





XX X XX M .X RY XU BX X BXX X  
 BS RQ M X BXX X X XU X BX -  
 X X BXX XW 2XB M Q X X X X -  
 Q BX Q D RXX MB X X X BX  
 X RRW DXP M X X BX X B-  
 XRXRXR

XXXXXX

XXXXXX

Picture 3. Neoplastic process on nasal, frontal bone and maxilla

XXXXXX

XXXXXX

Picture 4. Neoplastic process on alveolar bone and mandibular premolars

XXXXXX Conclusion

8BXP X XW RRQ MM X XBX  
 LXX X BXX W X RQ X LX  
 W X BXP X X BX RBX  
 stomatognatnog sistema.

8 X M X X RRQ XW X WBBM D  
 BXX W BXXJ W X L X W  
 BXX RBXX 3RX X M X Q X X  
 XW BXX LXX RBX M DX X LXX  
 X LX BB RBXXM X BXX LX X  
 XW X RG X X X X X X  
 EX X RW X X X X X X X  
 RJ W LXU BD X LX W BXXH X  
 XXXXXXXX

XXXXXX /XXXX/ X

1. BX %G BW 3 BXX X BXX Q BXX X RI  
1RX X BXX
2. BX : 9Q N 7( 7K W X X BXX Q W BX RXX X Q  
BXXBXX

**MINRODLFGHNDGLMDRND  
QMPHAKEROMHND SHURGRRLMXPDSDDLPDND**

3. ~~RRR~~
4. R \$ BQ 5 W % R B BQ Q W R WRD Q  
~~RRR~~  
 \*R & RR BQ Q RRP 6 B 9W R R1RW R R  
~~RR~~  
~~RRR~~
7. R & 3B6W R Q BV RRR Q R 9W  
~~RRR~~  
~~RRR~~
8. W 1 0BY 0 0B ä 7P = RW LW RRR R R  
~~RRR~~
9. W 1 0B ä 1ND 3 -BY B \$ RRR Q RR -  
~~RR~~ R R RW RW \*R B BJ B W 9W
10. W 1 0B ä 7P = RRR Q RRR  
~~RR~~ R R W RQBV R\*R B B W 9W D
11. W 1 3W 2 0BY ' 7P = RD 0 0B ä D RR  
~~RR~~ Q D RR RR R R W Q\*R R BV
12. D 0 W . 3B R W RR Q W BV 9W 0B ± R  
 ±
13. 1B % R R W RR 7R Q RRQ R 0B  
 4-19.
14. 1B % BQ R W RR -R R19W W  
 20 ( R 03 BX \*- 7K RRR RRR R W  
~~RR~~  
 3BY 9W 0BY R R B W 1ND BY 9R R W RW  
~~RR~~ R RR RQRR W 9W
17. 3BY 9W BY 9R 0BY R R B W 1ND 0BY R  
~~RR~~ 7K W RW RR Q W R R RRR Q RR
18. B 6 3B R RW P W Q W RR 0BU & W  
~~RRR~~
19. W % RE % 3BRRW Q W % RE % RR W  
~~RRR~~
20. RR 07 BQ R W RR 7R Q RRQ R 0B

ENGLISH

**X-RAY DIAGNOSTICS OF MOST COMMON PERIODONTAL DISEASES IN DOGS AND CATS**

**MINROD/DPHYLDFRBYLMDQBYLQDYDDBYLNDR**

**HDO GLMDMVLGRV DQ FDWDH RILEHDVQ LPSRDEH LQYHWUQU SDFWFH  
 J RWGLDRMG DQ HDWG RQPH W FDQVDEDA DIHFV TXDOLWOLIBG SHW**



988888

88888

W D O RBB RIRBB W D DB/ RIB/ W V Q  
 RW OW RRCW SB W W B Q W RIV W  
 RZ BW RIRB W Q O O W W RBV Q W RIB  
 RX BBD RBO RIV W 7K RW RIV B V W/BW RWR/RW  
 RRQ BOW K O O W W O W D O D W/RV  
 W W W BQ Q W B Q RB W@ RH W WRW OW  
 BB

.88888



■

■

8888888888888888

bagb amh m kZ b dh aZ k\_ p\_ agvgh k|h  
 \ libz ijzib\_ a klgb klibb b egb gb  
 jnl kivagh ibv gZ dzh agb b a|h\_ zgb ih\_\n  
 dljly jhZpZvgb kklfu dZ v libzb klibb  
 wky zuf h klibb Z ijZvgb h aZb b  
 ndiZ amZ h Zkijmdlmj\_ dklgb qb h mdZ gZ lab b  
 ga jZeguo iZdb kklgb amh ZgZ jZ gZgZ gZ  
 lh tp agZ gZ h agbZ iZdb Zgb k  
 dlub Zgh klZdy libZ klibb edb lguo  
 b klneZ kklZdh jZb W pZb \ pey jZb  
 ZkZvgndlguoZklibbZdbijpZj

Z\_ keZ pagb amh jglndZ klibZ libZ  
 Zklibb





Culex ~~AV~~ LVD ~~HBU~~ LVD

XN~~V~~ VSD LWY~~A~~ ~~NB~~ Culex pipiens pipiens N~~M~~ N~~B~~ ~~D~~ ~~SE~~  
MNWBMD D L~~B~~ Aedes i 2~~W~~ LR~~Q~~ ~~W~~ ~~Q~~ ~~B~~ R-  
MX ~~B~~ ~~SPD~~ ~~Q~~ ~~Q~~ LD ~~B~~ LD R ~~D~~ M  
~~Q~~ ~~SW~~ RG ~~M~~ RG ~~W~~ ~~Q~~ LBP~~D~~ ~~B~~ ~~Q~~ ~~B~~ ~~Q~~ LD  
~~Q~~ ~~B~~ ~~X~~ ~~SS~~ ~~Q~~ ~~D~~ ~~W~~ ~~Q~~ ~~Q~~ L~~W~~ M  
~~W~~ P~~M~~ ~~B~~ ~~Q~~ D L~~W~~ ~~B~~ ~~W~~  
~~W~~ ~~RF~~ ~~Q~~ ~~Q~~ ~~Q~~ LD .RG M B-  
M~~W~~ ~~Q~~ ~~B~~ D ~~Q~~ X RM X ~~SS~~ ~~Q~~ ~~Q~~ ~~M~~ R~~Q~~  
BM ~~Q~~ ~~W~~ RM M ~~D~~ X~~RM~~ X~~D~~ ~~M~~ M ~~GR~~ ~~Q~~ ~~Q~~  
RPRX ~~SS~~ ~~Q~~ ~~Q~~ RPE ~~B~~ ~~SS~~ .RPD LD ~~Q~~ L~~V~~  
D DP~~M~~ ~~Q~~ ~~SW~~ ~~Q~~ X ~~Q~~ ~~SPD~~ ~~W~~ ~~Q~~ ~~D~~ ~~D~~  
~~Q~~ ~~Q~~ ~~Q~~ 1~~FM~~ ~~Q~~ ~~Q~~ X~~SS~~ X~~SS~~ ~~Q~~ ~~Q~~ ~~Q~~  
M M~~Q~~ ~~M~~ ~~SP~~ ~~Q~~ ~~Q~~ ~~Q~~ ~~D~~ G E M ~~Q~~ ~~Q~~  
RPE ~~SP~~ ~~Q~~ ~~Q~~ LD ~~SS~~ LD  
SV LD D M ~~W~~ ~~SW~~ RG ~~Q~~ LR~~Q~~ ~~Q~~ PR~~M~~ XPD  
~~Q~~ ~~SW~~ P~~W~~ ~~W~~ ~~SS~~ R~~Q~~ ~~W~~ LD ~~W~~  
~~SS~~

~~Q~~ ~~Q~~ ~~Q~~ RG ~~Q~~ ~~SP~~ ~~Q~~ ~~SS~~ ~~W~~ ~~Q~~ ~~Q~~ -  
D .RG P~~M~~ ~~Q~~ ~~Q~~ RRB ~~B~~ M PRX ~~SW~~ ~~Q~~ ~~Q~~  
~~SS~~PL RM ~~Q~~ ~~Q~~ ~~Q~~ ~~Q~~ ~~Q~~ ~~Q~~ ~~Q~~  
~~W~~ ~~W~~ ~~Q~~ ~~Q~~ X ~~Q~~ ~~Q~~ P~~Z~~ ~~Q~~  
RB ~~Q~~ ~~Q~~ ~~Q~~ L~~W~~ ~~Q~~ ~~Q~~ ~~Q~~ RG  
~~Q~~ RG ~~Q~~ L~~W~~ RG ~~W~~ RRB PR~~M~~ M ~~W~~ ~~Q~~  
~~Q~~ R~~D~~ ~~SW~~ ~~D~~ ~~SP~~ D P~~SS~~ ~~Q~~ PR~~M~~  
~~SW~~ ~~B~~ ~~W~~ ~~Q~~ .RPD .BH LD ~~Q~~  
~~SS~~ LD .RG ~~Q~~ ~~Q~~ ~~Q~~ LRG ~~Q~~ ~~SP~~  
~~Q~~ ~~Q~~ ~~Q~~ D ~~Q~~ LX~~B~~ ~~Q~~ M ~~Q~~ ~~SS~~  
~~SS~~

8 ~~SS~~ MR~~M~~ M ~~W~~ M ~~Q~~ D M ~~Q~~ BM ~~W~~  
LR~~W~~ ~~Q~~ ~~Q~~ ~~SS~~ ~~SS~~ D ~~W~~ ~~Q~~ LR~~Q~~ ~~Q~~  
R ~~SS~~ X~~Q~~ M L~~Q~~ M ~~SS~~ ~~Q~~ R~~Q~~ ~~SS~~ X~~W~~  
~~SP~~ L~~Q~~ P ~~Q~~ ~~Q~~ L~~Q~~ ~~Q~~ LD  
~~SS~~ LD 1D ~~SS~~ ~~SS~~ ~~B~~ ~~W~~ R~~Q~~ ~~SS~~ ~~Q~~ ~~Q~~ M  
~~SS~~ ~~Q~~ ~~SS~~ ~~Q~~ ~~W~~ ~~D~~ ~~W~~ ~~Q~~ ~~Q~~ ~~Q~~  
~~W~~ D M ~~SS~~ ~~Q~~ ~~W~~ ~~SP~~ ~~D~~ ~~SS~~ ~~Q~~ M M  
~~Q~~ X~~SS~~ ~~Q~~ L~~Q~~ ~~SS~~ ~~Q~~ ~~Q~~ ~~W~~ ~~W~~  
~~Q~~ ~~Q~~ ~~W~~ LR~~Q~~ ~~Q~~ L~~Q~~ ~~Q~~ .RPD .BH L  
D ~~W~~ ~~SS~~ LD ~~W~~ LD

8 8W 88 RQ 8 R88 X R8M 88 X R8 X  
 W 08M 88 8 L\*8M 70 LD 8 LD Q  
 V LD 8 LD 8 LD 08 8 BL -  
 88 MRQ X\*8M RRP 88 8 88M 8W 8  
 R88M M 8 88 L 8W 88 8 LD 8  
 LD W 88 X 88 M 88 88M 8W  
 8 8 L 8W 88 8 LD 8 8888 W  
 8 MR8 LRG 88 Q 88 88 8 W/L8 8RW -  
 88 8 8 8 W X 88 X R88M 8 8 8W X  
 88 R88 8 W 8 8 88888  
 W 88 88 M 8 W X 88 88 8 W 8 R88  
 R8 88 888 88 88 8 88M M 8 8  
 8W L 8W R88M M 88 DWX 88 RJ 8 8  
 88PD 8W \*88 LD 8 88M 8 88M  
 X R8 88P R88 8 88 8 W 8 8 8  
 R8 88 2G 888 88 RRP L 88 W M8  
 PR 888 8W 88 88 LD 8 8 M R8  
 8 88 RRP L 88 8 8 M 8  
 8  
 8 R88 8 W 8 8 8 W 88888 L  
 88 8 8 Q 88 8 X88 88 R8 LG Q W  
 8 8 Q W 8888 L8888 8 8 LQ PH  
 88888

Pojava infekcije 88

88

8 8 8 8 8 8 8 8 8 8  
 8 8 8 8 8 8 8 8 8 8  
 8 8W 8 8 W X 8 8 W R8 88 888 LD  
 888 88 88 8 X R8M 88 88 X 8  
 W R8 88J 8 88 Q 88 8 -88 X 8  
 8 Q 88 8 X 88M X 88 L88 Q 88  
 .R8888  
 8 8W 88 R8 M 8 888 8 W 8  
 8 X R8M 88 78 M RRP 88 8 8 W 8  
 8 88 8 W 88 88 88 888 X 88  
 R8 8 88 LRRP 88 8 8 88 8  
 8 DP88 8 LD 88 8 8 88 88-  
 8 88 L 88 88 88 8 8 M 88  
 88 R888 8 W L R8 8 888 888 888  
 8 8 88 Q 8 R8 8 W 88 R88 888  
 R8 M 88 8 8 X 888 Q 88 888

8888

10 . 0 B W W X R0  
 0 0 W 0 0 0 L R0P W  
 0 0W 0 0 0 1f & RBY LD  
 0 0 0 0 0 0 0 8 0  
 0 0 0 0 0 0 0 0 8d0  
 X 0 0 0 0 0 0 0 0 8d0  
 0 0 0 0 0 0 0 0 8d0  
 R0P 0P 0 0M M R0 N R0M 00J R0  
 R0 Z PX 0Z . 00 0h 0 0 0 P 0  
 0 0 1X 0 0 . 0 Z W 0  
 0 0 0L0 0 0 0 L0 K M H  
 0 0 X W L0 0 0 0 M R0 0 0P 0  
 0 0 R0P 0W 0 0 0 1f & RBY  
 LD 0 0 P 0 0 0 8d0 . R0 W  
 0 R0R 0 0 M R0 0 0 0 0  
 8 0 0 0 Z 00 0 0 X 0  
 0 0 0 0 10 \*4 0 W 0 0 1Z 0  
 0K d0Z 0 0 0 0 0 0 0 0  
 W Z d0W 0 0 0 . 00 d0 0 0 0 Q  
 0E 0 0 10 0 0 0 0 0 0 X 0M  
 Z 0 0 0 X 0 0 0 0 0 0 0  
 0 0 0 0 X 0X & 0 0 0 0 0  
 8 0 0 0 0 0 . X W 0 0 0 0 W  
 PX 0Z . 0R 0 0 L0 0 0 0 0 0 DX W  
 0h 0 0 0 . 0 0 PX R0D M 0 0 L  
 0 0 0 0 0 0 0 0 0 0 0 .  
 0 0 0 0 0 0 0 0 0 0 0  
 . 0 Z W \*0 0 0 0 0 0 0 0  
 0 0 0 0 L0W 0 0 0 0 0 0 0  
 0 0 . X W & 0 0 0 0 0 0 0  
 0X 0 0 L0 0 0 0 0 0 0 0  
 W 0 0 0 0 0 V PX 0 0 X X Z 0 0 0 R0R X 0 W  
 M RG RQ 0 0 2G 0 0 0 0 0 0 0 P0  
 000  
 0 RH 0 0 0 DR0 0M X L RQ 0  
 L0 0 0 R0 X W 0 0 0 0 0 0 0 0  
 0 0 Q 0 0 M 0 R0 0M 0 0 0 R0 0  
 0 1D R0X 0P0U PR0 M 0W 0 0 M R0 0 0 W L











REX BWU WU Q RBD M M PBE W LQ RBD M  
 RGE W W B B ND ± RPB L BG *Culex*  
*spp* BB B GR BE NB LBGW VHWK Q Q  
 W BW ± XE MBD W X W LBY Q RBD  
 Q RBD X W BBE RBE RRP RE W ±  
 M BB W WBD M W W -  
 W R M Q W LPRP PRBP W W  
 LD 1DRM Q MQ W ± W M RPB  
 M RGR M RMX X W W RPD ±  
 M W DR X B RN RPB RBE RE Q W  
 M RBE B W W 2R M LQ D BB B  
 W ± X R RPB Q B M 8W M RW L  
 RPB M LQ LBY B M ± W LD  
 TRRP RQ W RPB RE WBE D RMP  
 B BM ± X RDM BE X M M RW B  
 B RBE RPB Q BW X RW Q B M B  
 W RPD ± M D RMPD M B W XBG -  
 RP W RRP RG B RE BW W W  
 RP XE RG B RN W RPB M RPB  
 B D B RW LXR RPB RMX D MD B  
*pipiens* B G M and *Culiseta annulata* BWU LVD W B W  
 W B D V B D MB W H B B ± XMNWB MD WRM  
 W W W B B H S H B B B

B WHW W P NB VHE VWBQ WRR B LQ BD  
 BE 8 WR BX MQ BXWR HB ± W B B B  
 B B B NB X B VD B W H W H W D NB Q NB  
 V X B W B B W M Q D ± X NB D M W W V H B B  
 NB NB BW LVD B R W B M B G D V H B W W L  
 W G D ± Q B B W B D PR B W X R P B D R M B B  
 B W X B B W B B B B ± R B B  
 B B W B W R P R B B ± X W R P B D  
 R B B R W L B R R P B B ± Q R M D Q R P B -  
 B B

TRRP RQ RE M B H B RW B B  
 R B B R P B Q B W Q B B B M B 1 B Q W  
 W W R P B B L X B M B X B  
 X B M X R B X Q W L B W R B B L W P R P B B  
 B P R B B R P B Q W ± 2 G W B B R P B R M  
 X B X W B W D Q W R P D ± M W X  
 B B W M B H B Q B B B W B B -  
 M ± X R R P B D B L B B RE W M L B W  
 B B B B D X B B B M R G B RE W L D u  
 W B H N B R B D M D ± W W B X N B W R R L

RG M LRG X( 0 BPD 0 LV X 00 0 M  
 00/  
 RG 00 B00 0 0 RG 0 0/ LRPB X0  
 0 LW 0 RMS 0 RMX X00 RG 000 0 0  
 00 RG 0 L00 X00 \*0M LW 6 RBP Q RM Q M  
 0 M 000 0 X RY 0 R0/ 0 L0M 0 X0 RRP  
 L RG 0 LG 0 0 0 0/ P 0 0 0  
 0/ LW 6 0/ XM 00M 0 00/ P 00 RBP Q  
 000000  
 6 RBP Q 0/0 M00 0 0 RG 00/ 00/ RG 00  
 L0PB 0 0 0 0/ L0M 0 0 P 0M 00 0  
 0 RG 0 0/ 0 X0 M 00 RM 0 0X  
 X0/ 00 0 L00 0 00 00 PR00 0  
 RG 00 L0M 0 0 0/ 00 0 LRPB L0 0/ 0  
 000000

8 R0X Q 0 0 P0K 00 000 L0-  
 00 0/ L0 00/ R0 0/ 0 0 L  
 R0W P 0 0 D L0 00 Q 00 0 0  
 RG0 00 M 00 P 00 00/ 000 L0/  
 00/ 0 00 00 00 PR00 0 RM Q 0/  
 000 0/ 0 L0 0/ 0 L0 0/ 0/  
 0 200 0 PR00 M0 0/ 0/ 0 Q 0P 00 L  
 000 00 00 0/ 0 L00 000 0  
 G 000 ± 0 RPB 000 00/ L00 K  
 PRX 0/ PE 0/ 0 00 PR00 ± 00 00 L  
 0 0 M 0 Q 0P L0P 0 0/ 0 X0-  
 G 0/ 0 0 M 0 000 0/ Q 0 00 -  
 0 ± 0/ 00 L0 0 RRP 00 P0 0 0  
 X0Q X0R0M 0 0U 000 0/ M 0 00/ L0  
 R0 0 0 RG 0 L0P P0 RG 00 X00 0/  
 0W RPB P00 0M 0/ 00 RM M 0/ M0  
 Q 0X 00 R0 0 0 LWX0X Q 0 0 R000  
 0 0 Q 0P RM DRQ MR0 Q R0X 00M 00  
 R000 00 X L RQ L00 000 0/ 0-  
 0 RG 00 10 000 RG 0/ 00/ P 0  
 0 0W 0 X0 00P 00 00/ 0 0/  
 0 00 0/ ± 0 0 Q 0P 00 0/ 0 0  
 0 0 M 0 00 L00 00 0 R0 RPB  
 0 R00 0 0 0 X00 0M 0 0W P0 -  
 00 L0 0/ 0/ 0 L0 K 0K 0/ 0/ Q

6 RBP Q BW SBD PD RMW PR M  
 Q PRBOM P BX RM M RM M BX XW  
 PRM M Q BW G H RRP LQ RQ P W  
 M M Q Q BW V D DBE LW PH W  
 W W LPH RRB RPB W W W W H W  
 BW W BM RRB RRB LW RW P W W  
 BRBQ

ACKNOWLEDGEMENT:

5DG M-HBOLRBO SR SBMHWX 75 NRMLDQD OLCWUWV SBMWH DKH L WKEORRJR  
 DRMD 55KOLNH ELMH NDR L SBMHW 75 QDQD RG LVVRJ OLCWUWV L SBMHW EBM  
 BRG RW P W LBEM B

This work is realized within the project TR31084 funded by Ministry of Education, Science and Technological Development of the Republic of Serbia, the project TR43007 funded by the same Ministry, as well as the project number 114-451-2142/2011-01 funded by Provincial Secretariat for Science and Technological Development AP Vojvodina.

W F

- 3 OB . 7BW ' ORW \$ 7B 0 B \*RE 5 BB 05 OB  
 6 RBW / OB ) B \$ RQ B RIRBX W 1B M  
 BRORS
- 7 B ( B . 8M . B ( BR + 1RW 1 B Q  
 W RIB W 1B M W BX PW B V
- M W ( .W 6 BY 9 OB - B 9 BY \$ L \*B \$ B  
 \* B RIW 1B M BQ Q B W W OBRB B BO  
 1R±
- % 7BQ BZ Q B BRB RIW 1B M B W  
 B  
 RBM 0 \*D \$ RBY 5 BB B X6 B RBW B BO  
 1h  
 W 3 \*BQ \$ B = RB \$ ORB ) B \* B 5 BRB RIW  
 1BRB 7BQR
- B \$ 7RBBV \* RB \* BX 0 W 0 B W % 7RBBV  
 / B 0 BV % BRBBV 7 2B RIW 1B M BQ Q  
 \*B
- \* B 6 B + OB % W 1B B B B BQ Q B B Q  
 RBPBRBRBR
- % B \$ RB ' RBY ' BY BBY 0 OB 0 OB - B-  
 N 1 D ä 1RW 1 \*D \$ BRBRBRB BQ Q  
 PB RIW 1B BQ Q W B RIB B W B RB  
 BR2%

10.

788810

10. 6W 8 6 W 1f Q W ± W W % 6W Q

11. 6W 8 6 W 1f 2RE ± 2RE % 6W Q W

12. 6D . 8M . 8 ( 8 / 8 ) 8 - 8Q 7 8 Q 888  
W/ RIB W 18 M 8Q Q 8 RIB Q 8 8U 88

88 W/ RUE 8Q Q 880 & 88 8 R1W 18 M  
RUW 8 Q 88 RW 88 88 1RME W  
8 @ RW Q 888

14. 88 W/ RUE 8Q Q 880 & W 18 M ± 8Q W  
1RME W 88 88 @ RW Q 88

88PB ( 88 ' 08 7 8 % 8 \* 8 6 8 -& 88  
7 W 18 M 88 Q 8 8 88 Q 88 88 Q 8 W  
088880

\*88 , -888 -\$ 18 6 88W \$ 88W 0 8  
888 9 8 \$ W 18 M RW Q RW Q 88 8  
P888±

17. 8 ( .RPD 1 18 5 08PB 6 28 ' 88 \* 888 Q W  
8888888

18. 8888 , 888 ' W/ ' 088 9 -88 9 8PB 0 88  
Q 8 R8 88 88 18 08 8 88 88 1R

88 = 88 - W 18 M ± 888 0888 8 8 Q 88  
P888

20. W 8 8 8 8 88 h 888 88h W 8 8  
18 Q W 8 8 X 8 RW Q W  
8888

21. .RPD88 78

22. .RPD 1 W 18 M 8888 Q RW Q 1RW 88 8 8 8 88  
±

.RPD 1 8 6 88 6 1RW 1 8 ( W ' 8 % 88 5 8 0  
88 88 RI1RW 88 8 8 W 18 RN 88 RW  
18888

24. 888888  
8 6 18 0 8 \$ 8N + 08 . 08 7 88 ) 08 8 88 ' )  
.88 8 8 ) 88 3 8 \* 888 8 RW 18 M 88  
888

88 ' 088 0 8 6 888 - 88 % 88PB ( )  
888 7 8 -& W 888 8 RW 18 M W Q RW Q  
8888888

27. 08 - 8 \* L \*8 \$ 088 ) -8 % .88 6 8 1 W/ ( 888  
8 RW 18 M 88 Q RW Q 88 W 8 88 1R

28. 088 0\$ 8 -& W 18 M 888 88 W 88 - 88

08 6 8 8 88 5 88 7 88 ' 188W 1 888 8 RW  
18 M 88 Q W RW 888 RI88 8 - 8 M W  
88

B \$ 7 788X . \$ 788 \$ 1R2W 1 \*W / -  
 BQ RIW 18 M \*E PW W L RO ±

W ' NY , 88Y - NY ' -W W 9 08M 9 .R8  
 \* RPB 0 NY \$ .RM \$ 08Y ' P 8 0  
 W 8 M Q Q RD Q PRM Q BQ RIB 8 W  
 ERROR

W ' RPB 0 NY \$ 5 NY , 08M 9 -W 8  
 W 9 D 6 NY 7 W 18 M Q Q PRM Q 8 8  
 888

NY 7 \$ NY ' D \* RRPB ( ' .NY 0  
 D 6 D - & OR8D W 18 M 19 BQ Q 8 Q 8 8  
 W BQ Q WQ RI:19 W BP 8 88  
 RO

NY 7 D 6 NY ' D \* L ' NY ' NY 6 08M 9  
 NY , W ' 88D W RQ:19 8 Q RW QRM-  
 Q W W RQ RW Q 8 Q 8 80 8 8  
 2%

88Y \$ 88D 09 .D 6 88 7\$ 88D 29 8 9 88D -  
 J RIW 18 BQ Q 88D 8 Q BQ W/W 8 Q PRW  
 8888

88Y 1 08M % 88M \$ 8D - NY / 1NY - -NY ' NY 2  
 2W RIW 18 M BQ BRQ RD Q 8 W W/288  
 88

8 \* 8 \* OR8 ) 8D 8 ) L \*8\$ 0D 9 788U / ORW )  
 BQ & 8 0 78 & 08Q 6 8 , 8 5 8 RIW 18  
 ERROR

8 & 8 \$ 8 & 8W 5 8 \$ 788 \$ 8 5 18  
 0 188 \* 80 \$ 2W RIW 18 M BQ Q RD 8 8  
 8

8W . & M 73 M \$ 8 + \$ 888 M RW BP W 888 RID8  
 888 \$- 7888

40. 7M 8 BQ 0 RR8W W 18 M - 8 W 08 8F ±

41. 7D 7) 888 ) 8 & 88 \* & 18 1, 8 8E RIW 18 W  
 8888

42. 8V \* 7888 \$ 88 & 8X / W 3 8X 9 8 & OR8 W  
 BQ Q 88 W RIW 18 M 8 Q W 8 8 8  
 8888

8 8 08 .0 W 0% 18 + W 18 M QW W 88 8 8  
 88

44. 8 - 8D 9 RE 0 \*88 BQ RIBM Q RD -  
 8 -R8 RI8 888W 0888W Q P888W 8

8 + 8 = 8D 7 1R2W 1 RR8W PR88 8 88 -  
 8 8 RIW W 88 88W Q 88W W RIW  
 8888

88 ( W 6 8 = 8 6 8 + 1R2W 1 W 3 W  
 BQ Q PR8 W RIW 18 M BQ Q 8 RIB QW W W  
 RIB888

47. 8 8 88 ' 8RW - 8 0 08 . 1R2W 1 \*88 0+ 0R8D RI  
 W 18 8 BQ Q \*8D RR8M Q 8 W RO

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( \* 6

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W B M 9 V D W P W J W / W / S  
 W M V P W Q W Q Q P R V Q Q B W / Q R W  
 Q P R W W W R Q W R W W 7 K B Q Q R W  
 Q R Q Q B B P W R U W B W B P Q Q  
 B P W B B W D P W W W B W B B  
 Q W R I R W W B B R Q R U B R Q Q R W  
 B B B B W B R W W Q R W B B B B B B

7 K B B R I 19 B Q Q B V B B K W W B -  
 P R W B Q B R Q W D R Q W B R I 19 B Q B R Q M W  
 Q R W Q W W R W Q R W B B Q Q R Q B B -  
 B Q 7 K W R I W 19 B W W R W R Q R W B R G B B R W  
 Q W R Q B W W V B Q W W R I W B B W R Q  
 B B R Q R W B B B B B B B B B B B B B B  
 W Q B B W W R I W W W R Q 19 B Q P R W -  
 W W Q Q B B D M W R W Q B B W Q B Q  
 B Q W D R Q W 19 B W W R W Q R Q B B Q B Q  
 W W B B Q W W D R I 19 R W Q Q B B  
 B W W B B R Q 19 B R W B Q W B B B  
 R I W M Q B B Q R I 19 B Q R B Q B Q B B R I  
 1 B R Q

. H B Q W 1 B M B G Q M B Q B P W Q B B B  
 R B B R B B B

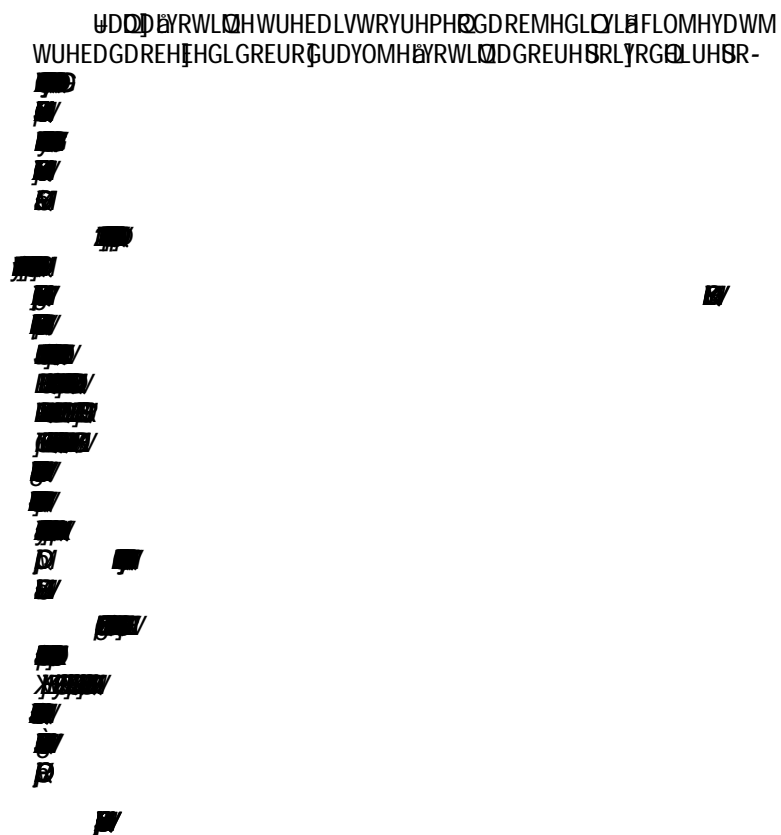






THE APPLICATION OF BIOTECHNOLOGY IN ANIMAL NUTRITION\*

BIH UDUNRYLY BGPLODHGHOMNRYLYDLORYLYHOHOBWUMNLY%  
BGRYLYGUGRYLYHWODD



\* Rad primljen za štampu 17. 08. 2014. godine

U F W B D B B SRU G F W B B OBY B  
SRU G F W B B 10BY SRU G F W B  
B W B SRU G F W B B BY W G F W \*B  
Y B SRU B D B LRW BY W B 8B  
zitet u Beogradu

Uvod / URGWLRO

RRM RMM R W RD XRW R R  
 XRP RM R LXRP RM RW MRW RM R  
 R X R LXRM R R MGRW RW R R  
 RRM R R RR LR XRW RRM RR  
 RW

RRM X R M R RRM XRW R R  
 RR R R RRR M RR R RRR  
 RR R R RRM LR R X R R  
 RR R R LR R LR DRK RR XQ  
 RM RR 1DRX RM R M R GRQ R R  
 RRY

D E W R D RW R G MR R J M R  
 RR R LR R R R R RW R R  
 R LRK RR R RQ R G R R RRR LG  
 RR G R RR RR W RQR ± RR RW RRR RP M  
 RRR

RR RRM M DR R R X R R R  
 R R RM RRR R ± RR W R J M R R  
 RR RRR R DR RRR RW RR RR  
 R R R RW R R DR R R R  
 RR LR R R R R RR RR RR  
 R X R M RR R RM W R R X  
 W RM RR R X R R RR RR DR  
 R R W W RRR R D RW W W RM  
 R RR R W W G MR W R RM W RR R  
 RP RR RR 2RR RR X RRR RR MR

RRRR/  
 ± W RM RR R RR RR W  
 RRR  
 ± W RM R D R RR R RR R  
 RW  
 ± W D RR RR R R RR RR N  
 RW

RRR  
 RRRRRRRR/  
 RRRRRR/  
 W  
 8 R W R XRRM RM W R M RR  
 RRRR

SECRET

URUPDRQDPDQWOBZLRWFQRUFDKORQ

DELRAWFLX PUMHQ P SRVHEXXFLOWELMD UW AYRAMD  
Q X M NRULMOLIRG BGLQ DLYUOEUR YHUNOK JK UW LQ  
WUHKYOH E DR P MLKYHSRIWYB YHULP PRM BQYE SDLEW  
HIHNWUHLMD RMHYHURENHWLMQUD UHLMELMDUHLGMDLRAW  
NDX BLUQFBD QPDRJ SRUHNORM HQRNVQ GHMVR Q M  
P MPOLAH UW AYRAMNRULMSULURGDWUDYQ UHNDSDUHELRAWUR  
ELRAWFLDELRAWFLLVELRAWFL

BRELRAWFSUHGMOMDXPRW LERUDMPDBLMH UW NRULMHP  
LORONILKSRWELMDDPHQPD AYRAMDSRUHERP SURELRAWBWX M  
OLQ HIHNWB SUNRULMEXCELRAWNDVWP W M LEHODX PRM BQIOMHQ  
HIHNWUHLGMDNHQDHLMELMDHUUMHHQRNVQMGU

SRVHEHSRROMOKUWPLNURRUQPD NB MPDBUD UW P  
QYDM Q MHGRQRM PCHQFLGDBR GUD RUQD AYRAMPRM XSRW  
SRMGDSROMLHBMLSRWELMDSURLYRGQKRMQD

DNURRUQPL GLHWYQJ WNW REHEHIX QUPDE IFLMXQPFH  
SRYHODX VDOMLYRMPDLX PRVOLLWPRORNLVMP HGPL MOMM  
Q X BURME IFLMHQX XGRYROMSHUWJSHQ DLM P QD QYLA  
SRPLQHV NRQHHR LMOMYQHFRPSHWYHQRQ & NRMM P  
QYDQ YLAPHQPD YD WUPLQ NRULY RSLVYQHSURFHNRMLNR  
ULQ ENWULMEMOMMXSHEE SHHU LD .RQHHR LMOMYD  
QH SRGUPHYD SUHYHQLND LOMPHOMHQMHGEEWULMMISRSDBLMH  
X URLMQRP WNW W W MHD YHURNSLUD NRQHP ED  
WULMMRBRSDBLMRFD ELHOD NQMD SRSDBLMURUGDESH SRREQ  
MCDM NPHOMLQGUH UHGLQORUGDSURLYRGELWUD MHGLQHQR  
WYNRQHEW YUW ZOH BAW NRHQRNRORQPLMSHCK  
PLNURRUQPD XFUHYSRW MISRQYRP NRORQLRQ UHLMQD H  
GPL WQHW BFFL DB NRMLRQUPDQ ENWULMMD  
SRSDBLMQRVOMH NRORQLRQ UHLMELMXQYDIX M Q BNROLNQHMD

NRQMHQLMPEHLSMDCQMQRPHSLWOX

QRNDQURLYRGQDELRAWNBWULRNLD

NRQMHQLMPEQMLYHMMNHL

REUPYQHQRGAYDDMS+

BHELRAWFX QVDOMLYMMFL KB NRMSRYROMGHOMQ GRPDQ  
MOHNWYMPDLX UW LLOWYRW MHGELWQHRJ EURMDWENWUL  
MDX GLHWYRP WNW PPH SREROMMQUQVHR WH GRPDQ QD  
VDM GDSUHELRAWFROMDQYRMHGHMWRORNDLQMPML BHELRAWGLUHN  
W WX XNRORQRMGMXMOHNWYQHUPHQLMXLSRPD RGUBOX HELRH  
SUYHQR NRULMHPRGVB SRHOMPLNURRULSRYHHP HNMUHLMH  
BSRH OMPLNURRULHFHRP RUGHQD PRX GDLSRONSRJWYB VMPMH



BIDNBIHULDPLPHELRLWQRUMHKVD  
BYRMVD

je. 8 BQ D W BQ BQ/ LQD Q D  
W RY BFG BQ I Q X BQ BQ Q RQ  
Q W Q B LRD E BQ Q BQ Q D BQ LQ  
BQ BQ BQ BQ/ W XQ 9BQ LD Q  
Q Q RQ B Q B RBY Q D BQ Q  
Q QO BQ BQ BQ BQ BQ W BQ BQ BN  
Q Q RQ B W BQ BQ BQ BQ BQ BQ  
BQBQBQB

BQ  
Q BQ B Q B DB Q Q Q BQ M RD V  
BQBQBQB  
BQ Q BQ BQ RBY BQ BQ W  
BQBQBQB  
BQB

B B  
Q BQ B M BQ BQ BQ BQ RW  
Q BQ BQ BQ BQ BQ BQ BQ Q  
W LD BQ BQ Q BQ BQ BQ BQ Q  
Q W D BQ BQ BQ BQ BQ BQ

materija u spoljašnju sredinu.

Q X B BQ Q RQU Q B BQU Q  
BQ BQ BQ BQ BQ BQ 16 Q BQ  
B BQ BQ BQ BQ BQ BQ BQ RR  
Q M BQ BQ BQ BQ BQ BQ BQ W  
Q W Q W B D BQ BQ BQ BQ

\*BQ X BQB BQ X M BQ X BQ  
Q LP 2D Q M BQ BQ X BQ BQ M BQ BQ  
B BQ D BQ BQ M M W X BQ BQ 1B R  
X D W W W B W X BQ BQ BQ BQ  
BQ BQ BQ BQ XREN Q B RM LQ B B  
BQBQB

Q B RRU W X BQ B BQ BQ BQ L  
Q B B W D X BQ BQ X BQ BQ  
Q 8 B BQ BQ RRU M X BQ W A BQ  
RRD Q X BQ BQ BQ BQ BQ BQ BQ  
BQB

8 B B BQ W B LRBQ RRD BQ  
Q B BQ BQ BQ BQ RRD BQ M B B  
B . BQURP Q ORFLURVW X BQBQB BQBQBQB

ment nalazi.

BB BB RB B W Q M M M RW W  
 BBRRRW  
 B RD RGG BB Rhi Rb W BQ W  
 D W RRP .D M RB RD RMB B DM W  
 B W B M W .RQ B BB M R  
 BBWW

9W 9W

B B BB BW LR B W RW  
 M W B B W B B D W B RW MG  
 M W B Q X B DB W B RQ B DXE  
 BR B W B RD WM M B D RB  
 B LW X B RRJ B B X Q M RP R  
 W W XRB RB BRG I BD M W RB R  
 iskoristivosti i uniformne raspodele.

B MG M B RG B W D W B  
 B W W 1M B B B W W B  
 LW X W W X B ORU BU W Q W W  
 B W RB X B W S BQ B W W  
 BB

BB BB

ORW B B RD B W B M  
 Q RB M X BB BB LB X RP BM RB .B H  
 W RD B X RW B R B RW X

pro 1BQ 8 BQ & 7D RM W  
 Q XRBM .RQ RK BQ E D Q W M LQ  
 RBX 1D RBX BQ MB BN BJ RBW RW  
 RBQ Q P BQ BQ B RBQ Q B B  
 Q BQ W M BQ BQ BRQ BRQ W  
 X BQ RBQ BRQ B BQ BQ RW B  
 BRQ W B X Q BQ BQ LB BQ B  
 RD LB RB W BQ RBM M B D B RB  
 BRQ B 8 V RB W X BQ G BWM RB R  
 BW B B BQ RB BQ B BM  
 Q B B M BQ BRQ BRQ W D B Q BX W  
 BRQBQBW

7D B BQ X BQ B 1BQ B  
 BQ & 7D E RBQ B BQ M B  
 B B B BQ BQ W M BP RBP RBQ Q  
 RB X RB BQ B BQ BRQ RB B B  
 BQ BB RD BQ BQ W B BQ W M  
 BQ X BQ BQ BQ BQ BQ 1D RM B  
 RB W BQ BQ LB BQ BQ M B BRQ H  
 W M RBV B B B BQ D B B

amino kiselinama nije adekvatan.

2RB W BQ G M B BQ J BU W  
 W B XBP W B RGRQ BD D BX  
 BQ BN M BRP BQ BQ BQ BQ  
 W B B RGV BQ B RMRB BQ G BQ  
 BQ B XBP W W BQ B M W B  
 BQ W M Q W W BQ B XBP B RBQ  
 BQ BQ B RX M BW X BWM M BQ B  
 LB XW BQ 1BQ W LB BQ BQ  
 J W BQ W B M Q W W BQ D M BQ  
 B BQ B B M BQ BQ RM X BQ LRM X BJ  
 BQ

.B B/

B BQ W RB RBQM X BQ BQ  
 B RB BQ W B LB B BQ B B RGRQY  
 B RB XBB D BQ BQ BQ BQ BQ B L  
 BQ BQ BQ BQ B X BQ BJ RM BRQ B  
 W X W W LB V W G RBQM BRM LX  
 BRQBQW



nog sistema i

8000                      80                      800000  
 000 00 0 0 0 0 0 0 0 0 0 0  
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 8000  
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 800000

8000

**RLPSPMLWRRTDLWIRRGRIQDRULIQ**

HOLNEURMAYMD SRNPH GDM LMRP &YRMDPRH MFD Q GR  
ELMDHBLUQFQDRSRUHNODRMERNYDLMDGMRGU&YRW

MHA IFLRQQ MMFL NRML NRULSUBERDYDX QPDK Q  
 PLUQFX MOHQRPD PE NLMOLELDLQ( LNRQRYD OLQONLMOL  
 Q & ONRYLÜ LD DHGHQ MMFL MDYQ X SUYHQB ERJ  
 RD M M YHÜD BGLQ XUORMXIFLRQD KE HA GLDQUX YHÜJ  
 EURMDRLYRQD RMH GUDOMDFDLPHQH SUHNRPHUBOHE PE  
 E&HMDYHÜSUREOHPLPRGHURDYRW

MHA M REUD S&D Q MFM LMB Q NYDLMPHD RGRQ Q  
 S+ YUHGRWPHNRH PUBRULUBW NYDLMPH RGU&YRMPUR RRELE  
 MDYMD XRYRMEOWX EURMDORHQ E&H GDSRUHGME NOMMX  
 MFM GUXKINRUDHMD RQYD SR&N SUHNDLW NRML M  
 na kvalitet mesa.

,V W L&W J 80/ 0 RD 0  
 80 800 0 0 0 0 0 0 0 0 0 0  
 2Y 0 0P 00P 0 0 0 0 0 0 0 0  
 RD 0 00V 000 00 0 0 0 0 0 0 0  
 X 000 000 0 00 0 0 0 0 0 0 0 0  
 0 0 0 X 00 000 0 0 0 0 0 0 0  
 0000Y

1DRQX 0 0 0 0 0 0 0 0 0 0 0  
 0 0 X 0 000 0 W/M RH 0 0 MRQ 0 0 0  
 0 0 0 0 0 0 0 0 0 0 0 0  
 0000 0 0 0 0 0 0 0 0 0 0 0 0 RX

ACKNOWLEDGEMENT:

WIDEBOH MH X RM SHWD BDEIE ELERH SZL D EFERNDOLWH  
KDE DDOOR BOD L NBBE E R DE GR BBD' FEEL DFR  
EU SHWD BDDF SHWD GMSBO DNWH IR BG DDOOR R WDE  
COWWDEDEKONVKEBLEDLNEIMH

The study was conducted within the project "The selected biological threat to the safety/quality of food of animal origin and control measures  
BMTARTOTECONBEBANCEDENBRCATONGENCEANDTECHNOLOGCALDELOMENTOFFEE  
OER



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14

& DEOM EDWLR R DDOO WUWLR EBE EPO WUWLR  
DE  
DLOH - 6 DWI DFLD EELDO BULWH DMQ LOBWN R FE  
92.  
W - \* BBEV BRX RW M ,W V  
RE 9 7K B RD W RD M D D BBU BE W  
BDE  
RW 0 7K BE RIB B Q B MQ RD BE RI; RD  
BDE  
R 0 .B 0 OEW RQ W Q BW BBU Q W B W  
RQ 3 7 BBU Q W B W Q BQ BBU Q W B W  
ONV 5 RM 9 W 0 ä 7K BW RIRW BE B RUW W  
BE ,BQ W B W RE OEW G W BW B  
ONV 5 BW RM W ED W XQ BE Q BBE W  
W/LW W OEW B W W BE B 8W X  
1BQ B BQ 1W W RUBW W B 1BQ B RI  
BQ  
2B Q 7RW 2B 1W Q RRQ S 1BQ B RI B  
BQ  
BBBQW 7BBERB  
B\ 9 B/ Q W R/W B W ,Q ,BBO OBD Q W  
B  
BY 6 W W BQ ED W Q W W LBKE H  
W B XRM RRM W W B 8B  
ziteta u Beogradu, 2014.  
B ' & B W BU B 1BQ B RI B BQ &

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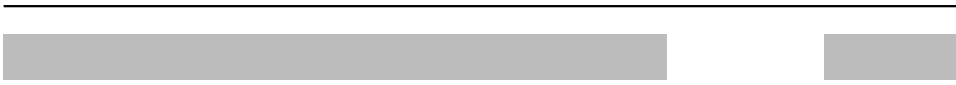
THE APPLICATION OF BIOTECHNOLOGY IN ANIMAL NUTRITION

BIOTECHNOLOGY IN ANIMAL NUTRITION  
BYRON

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BYRON







W SRG 80 0J RD W W BK  
 W 00 XRM 0 L0000 NM W 00 0M W  
 00 00 1000 0 W LRM RW 0W  
 00M M 0 00 D 000 00 00  
 20 LD 0 LW 0 10000 0  
 0 W 0 00 W DR0 W  
 M 0 L0 W LW LRM 0 0  
 0 D XRP W 0 R00 NM 0 0 G  
 0 X00 RG 0 0 0 20 LD 0  
 W LD 0 0 LD W LD 00 L0  
 1000 M RX 0 XRB 00 00 00  
 0 000 L000 20 LD 0 LD 00 LD  
 W M 00 000 00 00 W 000 0G  
 RM M 00 00 W M 0 0 00  
 RP L0 0P 0 W 00 0 D000  
 RSP NM W 0 W 0 000 00 W  
 RP 0 RSP 0M 0 0M 000P BRX  
 W 00 00 D 0000P 0P 0 X  
 0 LD 0 0 W R00 00 M RX 000 RG  
 R0 L00 0 D XRB 0 0 R00 RGM  
 W W M 0 0 0 0 0 0 0 RRE  
 Q W 0 W X 0 0 0 W R0 R00 L0 N  
 W LW 0000 Q 0 M LD 00 000M X  
 000 00 20 LD 0 LD 1000  
 W W 00 0 RM E 0 G W Q 000  
 R00 00 00 0W 000 X 00M 0  
 W M E 00 00 0 X0M 000 D00 0  
 00 00 0W 00 0 000 W Q 00 0  
 0 00 0 0 R0 L0 M W 00 0 W M 0  
 00 W LD 0 0M 00M  
 Q 00P W 000 M W 000 00 L00  
 0 0W 0M 000 LRW 0 00G RM  
 000

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1000

200 0 00 M0 R0 W L0W SRG W  
 RP 000 L00 W 0 LG 00 0X RW 0  
 W W 0 0 0 W X 000 0 M 00 RQ  
 W 00 0 0 W LG 30 LD 50 LD  
 D E M 0 RY W 00 M0 00 0 0 0  
 M XRM M 0 0 M G 00 LR0 00 0  
 M R0 LD 50 LD 200 W RMM RW P  
 000 00 0 W X 0 0Q W W 0 D 00

R0 RX W RGRK 00 X0W R0W 000  
 RM M 0 Q W 00M RW 00/ D 000 00  
 XRM M 0 0 RJ 0 M 0 0 0U D 000P  
 RK L000 0/ D 00 50 LD 0 W RK  
 W X LRQ RM 0 00/ 10000 M 0 X  
 M 000 00 0/ 0 0 G E 0 00 W  
 D 0M 0 W X 00 L00 R0 MG 0 0W  
 00M X 000 00 0/ 000 L0 R00 00  
 0 W X RW Q 89 0 0W 0 RW Q W  
 DR0 0/ 0X LX 00 L0 00 00 L0R0  
 P 0 W LD 0 LD 2R X 0L RJ RM  
 0 W 00 0 D 000 00 0W 0 W 0W  
 00M 00 X 0 R0 0/ D 00 0 000  
 0 0 R0/ 0/ L0 R00 RME RR  
 0 0 00 RRP 0W L0 0 WE RQ 0 0W  
 00000000  
 8 R0X Q 0X RM 0 000 M RX 00/ Q 000  
 0 000 0/ 000 L0 000  
 W

3R0000

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0 000 000 R0W M Q 00 0 R  
 M0 000 00/ LQ W 0 000 R00 00 0  
 0W 0/ 00W D 0M 0 L0W 0 LK  
 0 0W LR0W 0 L0 0 LD  
 W LD 0 LD 000/ RK 00 R00  
 W M 0 L00 0 R0W 00 LD H  
 0  
 300W D 0M M 0 RGR00 RJ RM M 00 0L  
 R0 000 M M 000 00/ X0M 0 0  
 Q 000 RM R00 .0 R0 0 W 0 00 0  
 00 0/ 0 00 00 0/ M 0 LR0 0  
 0M W 0 00 0 X00X Q M 00 00 0/ R  
 MM RW X 000 000 00 LQ W 0 M R0 G  
 0 00 0 0 0 0 LR0/ 10 0 L  
 0 0 0 000/ 00 0 X00  
 R0 R0 0/ M0 D000P 00/ 0 X00  
 W0 M0 R00 0/ RM X Q W 0 0 000  
 000  
 1R0 0/ 00 0 W X 00 0Q 00 0  
 0 W R00 00 L00/ 0/ RX M RW D 00G  
 0 00 0/ RM 0 0 100 M R0 RW X00



R000/ 007 RM 0 0 W 00/ 0  
 0 30 LD 007 M 0 W L00/ R0 0 R00  
 I 0 0J 00 800/ 00 W 00 RM 0  
 W 00 RX M RW P 000 00 P W 0  
 0 00/ 0 0 0 0 0 0 M 0 X 00 0 L00  
 0 P RRM 000 R00 LRH P 0 LD 0 W 0 LD  
 R0 M0 W/ 0 0 X00 M 0  
 00 W 00 P 10 MXRM 0J W 00 00  
 R 0 W 0 W 00 000 RRP 000P R0P RM 0  
 0 0 0 00 W P 00 P 00 0 0 LD  
 0Q LD 0 W LD 00 M 0 G 0 0  
 0 X00 0 W P 00 W/ Q 000 0 RR  
 0 W 00 LR00W Q W R0 00 00 0  
 00/ 000 0Q 00 000 00/ W LG 30  
 LD 0 W LD 0 W LD 0 LD 0 L  
 0 300 LD 300 W 0 W M 0 00M  
 0 0 00/ 0 XRM 0000/ RM 0 W/

3R0 00/ 0 L00 0 07 0Q R0 0 L  
 0 R0 0 0 L0 0 00/ 000 0 RR  
 0 W 0 L0W L0 00W P 0M LD 0  
 W/

3R0 R0 W/ W 0 R000 00 0 00  
 0 RW 00/ 00000 X00 00 0  
 00/ W W 0 000 R0 R0 P 0M 000  
 W R0 00 0 R0 L0 R0 R0J W RM  
 W R0 00 00 0 0 K 000 W 00 RU  
 W LD 0H L00 0 L0 0 LD

000 00  
 W 000 X0 0 00/ RM RR0 W  
 0 J 00 0 L00 0 LQ W 0 0 X X  
 0 0 W LD 0 W LD .R00 W  
 0 P 00 0 L0 W W 0Y 0 P R00  
 0 00 R0 0 000 D00 0W  
 00M RR0 M 00 RW 000 0 L000 W  
 W/L0W LG 0 R0 R0 0000J 0 0  
 0 LD 0 W 00 0 X 0 R00 0 0  
 R0 W X0J 00 X0 L0 R0 D00/ 0  
 W/K0 0M X0 00 W M 0 P Q 000 W  
 00 00 R0 X 00 R0 0 0 0 0

W LD RD LD 2D 00 RD E G B  
 R0 X R00 00 W RM RM RW 0M 0P D  
 L0R0 0 0 0 0 0 0 M 0 0W  
 RP 0W X 0R0 00 X 0 R00 R0 0Q  
 0 0 W L00 00 0D L30  
 W  
 0 0R0 00 W 000 RM/ M 0W/  
 0 0W RM 0 W R0 L0M 0 2M W/  
 F M RX RW 0 0U W 0G DRRE 0W D 0  
 W R0P RM M 0R0 D 00 0W D 0W R  
 R 0 L0 D W W X0 \*X LD 90  
 LD 0E LD 0 LD Q LD 0 L0  
 W 0 LD W LD 0 M W 0M  
 W 0 L0D W X 0R0 00 00 M M 0  
 R0 0 W LD 0 0 0M 0N W W  
 00 0W 0 W W W L0W  
 W 0 0RRD L0 0 W LD 0  
 0 0W 0 0M 0 W R0R 0R0J 00 0  
 W X W 0W L0 W 0 L0W 0  
 0 RRM 0M 00 LR0X 00 L0 W P 0  
 R0 RM 0W 0 X W XW 0 0R 0  
 0 R0W 0 0 0 0 LD 0 0R  
 P RM W P 00 D 0W 0 0 R0 M 0  
 X 0W 0 0 0RM W 0W RM R0 0R W  
 00 W 8 0 D 0P 0RP 0R W RK 0  
 W 0 M Q 0RP R00 R0 0 RM 0 W  
 M 0D L1. 0 0 0W RRU RRP 0 M 0R P  
 0 0R Q 0P RW 0 0 DW Q W  
 0 W 0R0 0 526 0 LD 5R LD  
 RQ 0 M M P 00 0 BRD RM 0 RU 0Q  
 LBW OR00 0 LD W LD W 0  
 00 RM 0 0 R0 W 0W W W M P Q  
 00 0W 0P 0P 20 M BRP 0 X00  
 00 R0 20 R0 00 RD W M P RJ 00 X  
 0W W BRG 0 0 RW 00 00 LB  
 0 0 RW D0P R0J 0 0R0 0 R0 M SW  
 0 0W 0W 0 L0 90 LD  
 0 RRP W W 0W M 0 X000  
 0 L 0D RM 00 R0 0R 0R0W 0 LD  
 0 2M 0M M R0 RW 0P 89R0W R0P RM RR  
 0 W R0 00 LD 0W 0W L0  
 MP 0P RM 0 0P W W W RR0  
 W RQ 0 L0R0 X0P R0 0 0P

00 M 0/ 0 00/ 0/ 000 0 0/ M 0 DL  
 00 00 0 0/ 0 00 0 0 0/ 0 L00  
 0 RJ 0 M RM 0 RX RW X000 000 R  
 00 0 0 90 LD 0 100/ 0/ 0 X  
 0 RX 0 0 X000 00 000 90 RR L  
 0 0/ 0 LD 50/ 0/ X 00 G 00  
 0 L00/ 0 L0/ 0 LD 00 0/ 0/ 0 RG  
 000 0000 0 0/ 0 0 OH  
 0/ 00 0 0/ M 0/ 00 Z 2 0 00 0 L0 00  
 02 X 0 RG0 00 00 0/ 0 000  
 000 0 L0/ L0Y 00 00 00 00 00 00  
 M 0 Q 00 0/ 0 00 526 30/ LD  
 0 0 0/ LD 30W 0/ 00 X00X Q Q  
 00 0 0 00J 00 M X 0 00W 0 1M  
 00 0 0 0 RGR00 0/ L0 0 20  
 0/ M 0/ 0/ 00 00P 0 00MM 0 0 0  
 0/ 200 00/ M 00 00P 00P L0P  
 0/ 20 50/ 0/ 00 X 0/ 0/ 0  
 Z 2 00/ L00 Q 00 0N X M 00/ 02 0  
 0 0/ 00 RW 000 0 0 LD/ 0  
 0 LD 0 0 LD 0 0 0/ 0/ 0 0  
 00/ M 0 0 00/ 0 0/ 0 0/ 0  
 0 30/ LD 0 00/ X M 00 0/ 00  
 0000 00/ 00 i 00 2+ Q LD  
 0 50/ 0 0/ 00 X G 00/ 0 0  
 šno deluju na 00/ i 000 X 00/  
 000 R00 0 0 LD 0 00 0/ 00 NJ  
 0/ 000 M G 00/ 0 0/ X 0 DX 00 RG  
 00/ 0 0 G 00 0/ 0/ 00/ 0 00 Q L  
 0 0 20/ 0/ LD 00 L00 0 00  
 G 00M 00 0 0 000 0 0 M 00  
 0 00 0/ 0 000 0/ 000 00  
 00 M 0 Q 0/ 00 00 00 00 0 0  
 0/ BRG 0 00 00W 0 0 L00 0/ 0 4L L  
 0 0 0 0 00 0 0 00J 0  
 0/ 00 M 0 Q 0 00 00 P 00 0/ 00 0  
 00 0 DX0 0 00 0 0 X 0 0 P 1.  
 00 L0 0/ 51. 50 LD 0 0 100/  
 00 00 M 0 X000 0/ L0/ 00  
 00 0 P 000 0/ L00 00 0  
 0 100/ 0 0 0 0 00 00 0 R

X 000/      W      L 00      LRRW      R0 W      D 00  
 000000  
      800/      0000      X 000      W      000      R0  
 0W      LB 0      00      0      W      0      0J      0P      0  
 WP      00      D 0P      0G 0P      00      0R0      RM  
 0P      20 W/      M 0W/      000P      0W/      RM 0      0 M  
 W      00      X W/      D 000      00      3W/      0  
 0 X 00      R0      W      R0      D W/      Q 0      RW  
 0      X 0      0W/      X M      L000      R00      L0W/      0 0      D  
 W/      00      0RH      0RY      LD      R0      LD      0  
 Q 00G      W      0 00      R0      0 W/      X 0      W      0  
 L0Q      RX      W      W      Q W/      0      L0W/      0 000      0  
 0 0J      0      L0      0W/      W      0W      W      RW  
 L0W      0W      000      W      00      0      2<sub>2</sub> LR0  
 RW      0      100      W/      0W/      0      LZ      0W/  
 0      M 00      D 000      000      RM 0      0M      D R0  
 0P      0H      LD      W/      LD      W      LD      0RY  
 D  
      1N      0W/      0 W/      X 0W/      0      0R0      X 0 00  
 M 00      W      M E 0      L 00      0      00      RR0  
 0 00      RW      0M      0      0 W/      X 0H      L0M      L LD      0  
 W/

0000      00  
      3W/      0W/      L 00      X 00P      W      W  
 W      000      RR0      W      R00      00      0      X 00  
 D 00      0      RR 0      W      LD      W      LD      W  
 W      00      RR0      00      D 000      0 M 00      RW  
 0      X 00      0      W      0      D L0W      D 00      0W  
 0 0      M 0M      0      W      LD      W      00      X 0  
 W      0      00      0      X 000      W      D 00  
 X 0 R00      W      00      L0W      00      X 00      M 0  
 00G      20      0      00      M 0      0      00      R0M W  
 0 000      .RGR0      W      Q 00      RM R0      W      00  
 W      0      0      0W      M 0 M 0/0      W      Q 00      0 L  
 0 X 00      00      W      RW      2<sub>2</sub> 0W      LG 00  
 W X 0      W 0 M      0      L0      M 0 RW      R000      00  
 W      000      0 0J      0      0      RM R0      0W/      0 00  
 0      000      0      W/      0J      R0      D 00J      0R0  
 0M      L0      W      LD      0      LD      10W/  
 0 W      W/      X 00      000      RX      W/      000      X W  
 D 00      X 0      00      RW      00      W      LD      2Y

RBRU Q 2 / MD RM<sup>2</sup> DQ<sup>2</sup> L<sup>2</sup> RM .B  
 RM 0 X W/ RGD U MD 1B 0 M W N  
 G 0 R0 W/ MD LB 0 W 0D LD .B  
 R0 RG SE M L0/ 89 U R0U Q  
 MD MD RM M 0 Q R0 0/ Z RM R0P  
 0 0 W 0 0 00P X 00P 0 RM W/  
 89 W 3RGP 89 0 U 0 W 0N 0 X RM  
 R0 M R0 W/ MD DRW 0 X 0RP R0 H L  
 0

10RU RX W/ LW 0 0 0D 0 W X  
 W 0 RM W 0H 0 0 LB 0 0D  
 0

0 00 P W 0 X LRU 0 Q 0  
 W 000M D W 0D 0 2Y 0U RR 0 L  
 0 R0 0D 0 X 00 0 0/ 0 R0  
 R00 3RG W 0 00 W M 0 LBRG 0 0  
 W 00 L00 0W0 0 0/ 2M 00 XD  
 00 0/ 0D 0R0 0 00 X 0 000 W  
 W/W

0H 0 X LS 0U 0 M 0R0 0 Q R0  
 R0000

10RU RX 0 0 D W R0 L00 R0  
 LQ W 0 0 R0 XRW W 0 0/ 0W  
 R0 W W LB RW 0 LB R0/ 0  
 0

NSR LSDOMLYRJ

DRW% NRMMX DNWRE PLNURRUDDPPNYDUDELÜ LDU  
RUPLUDMHDDLPKPHDEROLDYLV RGYUW PLNURRUDDPPNYDUDDUDNHUL  
VOK P SDNRYDQPLUDFX LRGYUW/SDNRYDQERUL NRML LORUSRULUDQ  
XSDNRYDQPRUDMELRREQ GDGHVWXSULMR PLNURRUDDPPNYDUD  
LLDPRYX SURPHOX ERMNRMELSRURDX MDDODQ LMFDRHGUAYRISUR  
LYRGDMMML ENROLNPUWDDK MPUD NRMRX GDM NRULM NYDOW  
WYR RGHUJYDQDGHQDFLNPNURRUDDQ RQYX DD NRMSURLYRGH  
HGDQRGDMHE NRULEQKMPUD ERJ YLRNHDELORW LRMOMLYRMH  
MPU NRMGUAPHDORNVGHNK BRODGHU BOYHMHLDU

DNUREQMPUL EDLUDQD SRUHELQRPDMULMDOSUHGWYOMRXX  
LREHDYDMXQpQ GHVNFLEBWHQK LPLNURRUDDPPNYDUDERSULOMÜ  
EHFHGRW SURLYRGGQ BOYHMHLDU ZOWILDU  
QIP NDRL NRCHLRQOE ELRORRPHAGHP GHVNFLEPNURRUDDPPD  
IFLRODH PLNUREQMPUD M PÖYD Q LAUDNFLMORÄDQ DOL  
SRMGMHUDDLpWSVHHLHOHNVLPRRELE W RYLMPULPD SUB SUHGQW  
XREOLEXLSUHFLDMGHVNFLESREROMDHOHNWYRW HGD RGSRPHQ  
WKKQNDMHLPRRPDQW MSDUDFLMMDRULWDBW QRFMFH NR  
MRYDE D SHFLP DMORPXFLOWXLRQDFLMMERLNURRUDDPLJ  
KUDERULEMHP RYPHAGHX HNDQW RG LJPOHYHQBRYHJ PH  
sa izolovana je RO E W D B BRQ Q

E D X W RB XBP BQ BPD B  
Q W RQ BQW iBQ D  
Q B LD W LD B W B  
MLW W M M W B P W B W D  
B N B B L B B W XW  
B B B X LD W LD B  
B M B Q W : W X X P W L B W  
B E W B X B W W W X B L B B  
W

W  
W  
WBRORU

DNR EPB ORVRRUM B ERYI GRWL XH VD P NCOMWRP  
LEFGRVX BE LWRRB PRH SWDDML SWEND UN E VDPR  
B GDM B M PRH WLBWL Q BRWLEY DOLBRWQ VGLQ BÖLÜ LVDU

8 R P X X P D W R Q  
 P N R L L L W L D L D  
 W L D 5 R L D L L R W X H D  
 Q R M B B B X R W D B W O B X W  
 M B R M W X B R K W D W W X B B  
 R W B J B M W G R W W R B B  
 W B B L G W L D . R G B B W W  
 B W B D B W R M R X B W J B W B B  
 W W X B D B P J B B B L D W L  
 D B B L B 1 B W X B R X B W L W  
 J B B B 1 D B B R B R M B B W  
 B W M R B B L R X B W X R B L W L B B M B  
 B X B R M M R W X B B L W B B B B  
 L B 3 R W B B X M B B W E L  
 B B B B X W B B B L D P B W  
 B E B B B B B B W B Y B B G R B B  
 G E M R B B B L B R B B B B B B  
 B B B O R B B L W B B L D B W  
 M G X B B B B B R G B B B W X  
 B 5 W W L W B B X G M B B W  
 J B B B B B B D B B B L G X B B D  
 R B W X R M B J R B B W B L W  
 1 B Q B X B B W W W B W B B  
 M W G B X W L B B B R X G B X B  
 B B D B X W B B L D B B L B B  
 W L D W B B Q R B B B B R G B  
 Q B M L R G R R B B B B M B B B B  
 B X B W B B X B W B B L B W W  
 W L D 9 B B B W B W B W R B  
 B B B B B B B L B L R B R R B  
 B W B J B M B B B W B B B L W X B  
 W B O R B B W R W B B B W Q R B  
 W  
 1 B W B B B W M L Q B B B B B W  
 R B W B W X W B W W B B M X R B  
 Q B B G R R J B M W Q B B 8 B B M M G M  
 B B B B B B W X M B B B W D G M R B  
 R B X R X M O B R M B M M B W M X W  
 W W B B M B R B W W L W B B B L D  
 B B L B 2 B W B B B W R B W  
 B B B B R W B B B L B B M R R J R B B  
 B B

, BB BW G M BW BU BRG RD X W P  
 BW LBB P B X BBD WRM B B BX X  
 RB BRJ B Q W W LD B X B  
 W B BF BBD XRM B LBBD DBW  
 KB BD BW XW B M M RD B BRG B  
 BM LW RBDM B B LD B RD B  
 B X BW RGRB RB RW LBW DB  
 W B LBB RM BBD B XRBJ BRD B LRE  
 B RBM LBW RB B LD W LD  
 W LD W LD B LD W LD  
 9B BM W BB MG XW B W BBD W B  
 W BBDW B P M W MG M BR B R  
 BBDW RB RB B X W RM B RW RG  
 BW BBDW XM BBD BW BRG LRQ X  
 G LBB BW RW RW BRB RM X B B  
 W RB M BW BRJ RB B XRBX Q RB  
 BRB B B M W B LW X B W B B  
 W BBDW P BRB B B M B B B B  
 W BBDW X B B RW W W P B E L  
 BB B LD B LD W LD W LD  
 .Q LD W LD B B W W B  
 G BBD W G B RW W W B W B  
 W W X B B B RJ B RW BM RB BN M  
 B XM B BBD BR BRD 9B W W  
 G MRD B B BBDW RM LW B RW B  
 W

**Conclusion**

3B BBDW XW B W BX BBD B  
 B DRB BW XBRG B M RW RD B  
 RB BBDP BB BBDW RX M BW LW  
 W M BBD B B 1BBD B B RW  
 B LW RRB XRBX Q W RB B W  
 B RW W B B B XRB M B B LRQ  
 B W B B B X B B RW L  
 B B BD BW BRG , BB B BW RM E B  
 Q BBD RRD B W B RW B  
 B Q RW B LB B B M BB X BBD B  
 B BM B W BM B W BBD B Q  
 W B B M B RBW LB BM BRG BB  
 N LBB RBM B B BB LW B W  
 BBDW





W

5E

- 1. B ' 0 \* : B/ W RIW RW BQ Q B  
 BRW Q W BQ RUW BQ B B B  
 545-52.
- 2. BURR BRB
- 3. B ) B ) B \$ \$ B \$ \$ B 0 0 B 5 0 W/D \$ B  
 B W RI B B B W Q W B B  
 B
- 4. B \$ B \$ . B RB B W B D B W W  
 B B W Q B B B Q B B B RRG  
 B B
- 5. B - B 0 B 6 B - 3 B B B B B Q W B B  
 B B B B E RW RI B B 3 7 HRRG B  
 B B  
 B B \$ 3 B \* : 5 B BRW Q RRG B B RI RRG B  
 ±  
 B . B & ORRH ( B & BQ 0 B - BQ RIB B B %  
 B B B RU BQ RI B W B B Q B B
- 8. B 0 & + 1 BRW RURRG B B RRG 5 B BQ  
 ±
- 9. B 0 & + B B W Q RRG B Q RRG B B  
 B B
- 10. B \$ - B 5 0 0 B 3 0 R B ä 9 3 B %5 \* B 0 6 B 7 \$  
 B RIR B B Q B B B B B B B B B RI  
 B B W 2 B B B Q B B B W B B B  
 B
- 11. B / 0 B - 3 RW ' - Q W B B B W W RI B B  
 B B
- 12. B ä 0 B 0 B - RW 0 B - R B - B 7 1 B B  
 B B B B
- 13. B / B ' W RI B BRW E 89 BQ B B  
 3 B B
- 14. B ) B 0 B \* B W \* B / BQ B B BQ RI  
 B B B B BRW 3 B BQ B W  
 ±
- 15. B B 0 B ä 0 B - B - R B - RW 0 B B 5 8 M RI  
 B B B B W B RRGB B B E B B Q B B B  
 B  
 B 2 0 B \* . R B & ( B 7 - B \* 0 B B : & 1 B B  
 B W B W B R B B B B B B B B B  
 B B B  
 B ' \* B ( \* B 5 BQ - 0 B W B B B B B  
 B B B B B Q B B B B 3 7 RURRG B  
 B B B
- 18. B 4 B / RRG B B RI B B B B RIRW B Q  
 B B B B B W B B Q RRG B B B



- 39. 35 RQ 6 ON \$ B - 5 2U %\* NO 0 0 100 W RI
- 40. L / + Q / 300 Q RQ R100 0R0 300
- 41. L + L ) D / B - Q = B / B + B < X 4 W R100 R00
- 42. Q < - L ' 4 D \* B / B ; 30Q Q B B/ R102 00
- 43. K < W 6 00 ( & W B BM RUR0 B0 B RU
- 44. RQ - 1B ' BY - W 7 RBY 0 W - RBY 0 W 0 W
- 45. 00 9000000000
- 6 BQ Q BQ R100 BRO 0RBW W R10D
- 00 \$ D ' 100 00 890 R00 R0 0U
- 48. 0RE % X .) B , W W Q B/ BQ R100V Q W
- 49. 0R00 5 B / B \$ R0V . RM % 50 7 W B W RI
- 50. 00 6 RRG W R0 W W R000
- 51. 10 / ( 0R0 RUM W R10 B0 W 10 / ( 0R0 RU
- 52. 20 . 00/ \$ 3 R0Q ' B , 00/ B0 R10M B0 ±
- 53. 20 / 3R0 ( 10 6 10000 Q RRG0 W B0 W B 3R0
- 54. 30 / % 0R0 \$ 5 D ) 5 9 200 B/ BQ Q B0 0
- 55. 30 + 0 H : . 30 & < B : - B & 6 00 B B0 B B/ W ,
- 00 B W Q B B/ R1W B0 W B0 RBV
- 30 1 W 0 RBY 9 B 1 RW 9 W 0 B B RI
- B/ B RB RIRG RB BM B Q B Q R0 B/
- B RB 300 R1W 9 BQ RB W B K
- 30/ 0 .W . B . 00 \* B W R0/ R10
- B/ B0 RB \*B/ W Q B B E B0W B0 B
- 58. 300 0 \$ \*BD ' R0 . 0 \*0 - & B W B R1W B0 B
- 59. 4L/ ) X = 5 B ; X & RX ; 30Q Q B W R100 B0/





DIPLOMIRANI STUDENTI – DOKTORI VETERINARSKÉ MEDICINE  
GRADUATE STUDENTS – DOCTORS OF VETERINARY MEDICINE

FAKULTET VETERINARSKÉ MEDICINE U BEOGRADU 2014-2015. GODINE

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-DZLOSNVGDU  
DZLSORPLUDZ

PPRYLILNROD  
DZLSORPLUDZ

UIMD  
DZLSORPLUDZ

ODUNRYLUDQ  
DZLSORPLUDZ

RYLOSNVGDU  
DZLSORPLUDZ

1LNROGREDQ  
DZLSORPLUDZ

QMNRYLQLODQ  
DZLSORPLUDZ

UDJLQ1LQVODY  
DZLSORPLUDZ

QVLOMFLQZPLU  
DZLSORPLUDZ

BYLQLOD  
DZLSORPLUDZ

QGRMFLBYD  
DZLSORPLUDZ

.LUDOMQDDã  
DZLSORPLUDZ

5DQRYLQPDQ  
DZLSORPLUDZ

QMGDUFLQVYLO  
DZLSORPLUDZ

-FLQUDJDQ  
DZLSORPLUDZ

ORUQD  
DZLSORPLUDZ

SDULRVSLVMD  
DZLSORPLUDZ

QVNYLQZLOMDQ  
DZLSORPLUDZ

QUNRYLUDJDQ  
DZLSORPLUDZ

QVLSQD  
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Tabela 1.1

|    |    |    |    |    |    |    |    |    |     |
|----|----|----|----|----|----|----|----|----|-----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
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| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60  |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70  |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80  |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90  |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Sheme, [REDACTED]

[REDACTED]

R [REDACTED]

[REDACTED] X

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED] L

[REDACTED]

S [REDACTED]

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[REDACTED]

[REDACTED] K

[REDACTED]

[REDACTED]

P [REDACTED]

S [REDACTED]

[REDACTED]

[REDACTED]

Primeri:

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1/2

CIP - ~~DZ~~ ~~haz~~ ~~im~~ ~~bd~~ ~~z~~  
~~G~~ ~~z~~ ~~eb~~ ~~h~~ ~~z~~

619

**VETERINARSKI glasnik** ~~ĐVRM)DN~~ ~~Q~~ ~~U~~ ~~V~~ ~~N~~ ~~P~~ ~~H~~ ~~E~~ ~~Q~~  
~~Q~~ ~~U~~ ~~V~~ ~~N~~ ~~P~~ ~~H~~ ~~E~~ ~~Q~~

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~~Q~~ ~~U~~ ~~V~~ ~~N~~ ~~P~~ ~~H~~ ~~E~~ ~~Q~~ - 3g ~~Q~~ ~~U~~ ~~V~~ ~~N~~ ~~P~~ ~~H~~ ~~E~~ ~~Q~~

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