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SWOLLEN HEAD SYNDROM (TRT): CURRENT SITUATION IN BROILER BREEDERS

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In four years period – from 1994 to 1997 twelve broiler breeder flocks in north east part of Slovenia showed clinical sings of swollen head syndrome. The disease occurred at the beginning of production period . The clinical sings was much more severe in females than in males. Morbidity was high, up to 100%, mortality was low (0 - 6%). Although drops in egg production were recorded, at the end of the laying period an average egg production per hen in affected flocks was only slightly lower compared to apparently healthy flocks.

Antibodies to turkey rhinotracheitis virus , detected by commercial ELISA test, were present in all affected flocks (12) and also in 9 apparently healthy flocks. Increasing of positive reactions during three years was observed.

INTRODUCTION

Respiratory disease of turkeys designated turkey rhinotracheitis (TRT) was first reported from South Africa (1). In 1985 TRT appeared in England and spread rapidly to affect turkeys of all ages (2). At about the same time outbreaks of new, clinically distinct condition of chickens , designated swollen head syndrome was reported in broilers in Spain, in hen and guinea fowl in France, in broiler breeders in United Kingdom, in layers and broilers in the Netherlands in broilers in Canada and in broiler breeders in Israel (3). The disease was found mostly in broiler chickens between 4 to 6 weeks of age and in broiler breeders between 24 to 54 weeks of age. In most cases disease spread rapidly (4,5,6). The methods by which such spread takes place are still not clear (7).

The primary causal agent has been isolated and identified as a avian pneumovirus Isolation of virus proved extremely difficult due to the fastidious nature of the virus and up to now virus has been isolated from turkeys and broilers in France, Great Britain, Italy, Spain, Hungary, the Netherlands, South Africa, Israel and Taiwan (7). Despite the high morbidity and often high mortality observed in the field, the pathogenicity of avian pneumovirus isolates has been difficult to asses in laboratory conditions. With the experimental infection of 7 avian species by intranasal route only mild clinical sings in turkeys and chickens, slight conjunctivitis in pheasants was observed. The virus was not capable to initiate clinical symptoms in ducks, geese and pigeons (8).

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Clinical observations

First clinical cases of SHS occurred in north – east part of Slovenia in broiler breeders and broilers in 1987. In broilers the disease has been mainly observed between 19th to 20th day of age, after vaccination against Newcastle disease.The symptoms were nasal sneezing, conjunctivitis and facial oedema starting around the eye. The mortality rate was variable, from 1 to 5%, depend weather other respiratory agents such as infectious bronchitis virus or mycoplasmas were present. At the necropsy lesions were located in the head region, caseose exudate in subcutis and mild rhinitis were seen. In some cases pericarditis, aerosacculitis and tracheitis were observed. Forward 1990 no outbreaks in broilers were recorded.

At about the same time the very similar clinical sings occurred also in broiler breeders. Clinical sings started in most cases at the beginning of the production period. The first sings were mild respiratory disorders, rhinitis and conjunctivitis, followed by swelling of the head, eyes and face. In some cases depression, incordination, torticoll , and opisthotonus were seen. Clinical sings were much more severe in females than in males. Mortality due to SHS was variable and in cases reached 6%. Many females died because of starvation - they were not able to move - or because of E. coli infection. E. coli was isolated from liver, heart and from lesions located in the head.

The disease last for 7 to 14 days, but very often the same flock showed clinical sings of SHS two or more times during production period. At post mortem examinations lesions in the head region very similar to those observed in broilers were found. Very often oophoritis and egg peritonitis were seen.

We tried to isolate virus in chicken embrios and tracheal culture, but we were not successful.

On the contrary to broilers, SHS is still present in broiler breeders, but it is localised only in north -east part of Slovenia.

Some clinical and production data from clinical positive broiler breeders flocks from 1994 to 1997 are presented in table 1.

Table 1: *Clinical findings and production data associated with SHS in broiler breeder flocks*

Year	Flock	Age when SHS occurred (weeks), intensity of the disease	Bacteriological findings	Mortality due to SHS	Drop in egg production due to expected
1994	1	28. +++	E. coli	5,54%	14%
	2	19.,26.,34. +++	E. coli	2,5%	15%
	3	30.++	E. coli	0,8 %	12,4%
1995	1	24., 27., 32., 54.,+++	E. coli	3,2 %	<1
	2	27., 31., + to ++	E. coli	2,0%	7,8%
	3	23. 27., + to +++	E. coli	2,5%	10%
1996	1	23., 28., +	Not done	<0,3%	<1%
	2	26., 37., 54., +	Not done	<0,3%	<1 %
	3	22., 34., ++ to +++	E. coli	5,5%	3 %
	4	26., 32., ++ - +++	E. coli	6,5%	3,2%
1997	1	25. 35., +++	E. coli	3,5 %	7 %
	2	42., +++	E. coli	3%	7 %

Although in all affected flocks drops in egg production were observed, at the end of the production period the average egg production per hen in affected flocks was only slightly lower in comparation with apparently healthy flocks. An average egg production per hen in affected flocks was 162,46 and in "healthy" flocks 163,1 egg per hen. Fertility and

hatchability were unaffected. The obtained results are very similar to those reported from other countries (4,5,6).

Serological examinations

Because the sings of SHS are not specific only for avian pneumovirus and can be confused with other infections such as Bordetella avium, indirect ELISA test (Svanova Biotech, Uppsala) was introduced in laboratory diagnostic. From 1995 to 1997 a rapid serological monitoring to TRTV of broiler breeder flocks was carried out. Sera for serological testing were obtained from 17 broiler breeder flocks. Some flocks recovered from outbreaks of SHS some of them were apparently healthy flocks.

The results of the ELISA tests are presented in table 2 and 3.

Table2: *Results of TRT – ELISA in breeders*

			ELISA results			
Year	Flock	Clinical sings	No of sera	positive	negative	% of pos reactions
1995	1	+	44	24	20	45,54
	2	+	26	1	25	3,80
	3	+	27	6	21	27,27
	4	-	58	10	48	17,24
	5	-	60	11	49	18,33
	6	-	25	3	22	12,0
1996	1	+	55	11	44	20,0
	2	+	56	18	38	32,14
	3	+	113	2	111	1,79
	4	+	103	22	81	21,35
	5	-	79	26	53	32,91
	6	-	94	6	88	9,50
	7	-	72	21	51	29,16
1997	1	+	50	43	7	86,0
	2	-	35	4	31	11,4
	3	-	94	87	7	92,55
	4	-	48	48	0	100

Table 3: *Comparative results of ELISA TRTV in clinical affected and clinical negative broiler breeder flocks*

	ELISA results: % of positive reactions	
Year	Clinical positive	Clinical negative
1995	31,58 %	16,78 %
1996	16,20 %	21,63 %
1997	86,0 %	78,53 %

	Clinical pos. broiler breeder flocks		Clinical neg. broiler breeder flocks	
Year	No of pos/No of tested	%	No of pos/No of tested	%
1995	24/44	54,54	10/58	17,24
	1/26	3,80	11/60	18,33
	6/27	27,27	3/25	12,0
1996	11/55	20,0	26/79	32,91
	18/56	32,14	6/94	9,50
	2/113	1,79	21/72	29,16
	22/103	21,35		
1997	43/50	86,0	4/35	11,4
			87/94	92,55
			48/48	100

Tabel 3

Age of tested Birds (weeks)	Year					
	1995		1996		1997	
< 30	Not done		9/89	10,11%	45/89	50,56%
30 – 40	28/155	18,09%	18/237	7,59%	4/35	11,42%
40 – 50	6/45	13,33%	37/169	21,93%	57/57	100 %
> 50	47/67	70,14%	23/106	21,69	91/92	100 %S

The results of serological examinations show that antibodies to TRTV were present in all examined broiler breeder flocks and that there is a lack of correlation between the serological results and clinical sings. The obtained results are very similar to those reported by other investigations (9,10,11,12). Cook et al concluded that there is no proof that only virus is responsible for causing SHS (9). Very important are also secondary infections, particularly with E. coil (5).

Distribution of the positive reaction which was observed during three years indicates increasing exposure of broiler breeder flocks to avian pnevmovirus.

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СИНДРОМ НА ОТЕЧЕНА ГЛАВА: МОМЕНТАЛНА СИТУАЦИЈА КАЈ БРОЈЛЕРСКИТЕ РОДИТЕЛИ

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Во текот на четри години, од 1994 до 1997, дванаесет јата на бројлерски родители во североисточниот дел на Словенија покажаа клинички знаци на синдромот на отечена глава. Болеста се појави во почетокот на продукцијата. Клиничките знаци беа поизразени кај женските отколку кај машките единки. Морбидитетот беше висок, и до 100%, додека морталитетот беше мал (0-6%). Иако беше забележан пад на несивоста, на крајот на продукцискиот период просечната несивост по несилка кај заболеното јато беше благо пониска во споредба со клинички здраво јато.

Антитела против вирусот на мисиркиниот ринотрахеитис, откриени со комерцијален ЕЛИСА тест, беа најдени кај сите заболени јата (12) а исто така кај девет клинички здрави јата. Забележано е зголемување на позитивните реакции во текот на три години.