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*Zoonoses and Food Hygiene News, published four times a year, provides a medium for disseminating technical information on matters related to zoonoses and food hygiene generated in the world, particularly in Nepal. The editors welcome submissions on these topics with appropriate illustrations and references. The views and opinions expressed in the News are those of the authors.*

## CONTENTS:

- ◊ Sero-Prevalence of Brucellosis in Pig of Kathmandu
- ◊ Recommendation of Seminar on Present Situation Challenges in Treatment and Elimination of Taeniasis/Cysticercosis in Nepal
- ◊ List of Publications by NZFHRC with ISBN Number
- ◊ News

## SERO-PREVALENCE OF BRUCELLOSIS IN PIG OF KATHMANDU

*Sujan Rana and Durga Datt Joshi*

### Epidemiological Background

Traum (1914) was the first to report the finding of *B. suis* in case of abortion of swine. Mishra and Shah (1990/91) detected brucellosis serologically in cow, buffalo, goat, sheep and pig in Nepal. They reported that the disease in Nepal is regarded as one of the occupational and public health hazards for veterinarians, animal attendants, dairy man, slaughter-house workers, butchers and meat sellers (as cited by Rana, 2002). A study done by Lefkowitz et al. (2003) on brucellosis in Yak (Naks), Chauris and hilly cattle of Langtang valley by MRT revealed the prevalence to be 17.6% (13 out of 74) in them. In a serological study carried out by Gurung (2003) on dogs in the Kathmandu valley, 10% were found to be positive. Joshi (1983) studied the sero-epidemiological prevalence of human and animal brucellosis in Kathmandu. Sera samples of 1430 humans, 1069 cattle and buffalo, and 247 sheep and goat were examined. The incidence rate was found 6.08% (87/1430) in humans, 8.7% (93/1069) in cattle and buffalo, and 3.64% (9/247) in sheep and goat. Serological investigations made on the incidence of human brucellosis in Kathmandu Valley by Joshi (1984) on a total of 2117 human sera revealed that 57 of the serum were positive for *Brucella*, i.e. the incidence was 2.7%. Van Der Leek et al. (1993) studied on serum samples collected from feral swines throughout Florida from 1974 to 1989. They tested for antibodies to *Brucella* species by the card test, the standard tube test, the rivanol test or the CFT. They detected seropositive swines with a composite prevalence of 23.4% (238 of 1015 samples; range = 5.5% to 33.3%). Analysis carried out by Mrunalini and Ranasastri (1999) of 10 yrs data revealed seropositivity to brucellosis in 7% goats, 4.14% buffaloes, 3.8%

cattle, 3.3% sheep and 1.2% (6 out of 486) pigs. According to a serological study done by Dhakal et al. (2005) in 56 slaughter goats and 35 slaughter buffaloes in Chitwan district, 5.36% of goats and 2.86% of buffaloes were found to be positive. Van Der and Priadi (1988) isolated *Brucella suis* biotype 1 from 13.1% of pigs slaughtered in Kapuk Jakarta, West Java and from 15.09% of pigs slaughtered in Surabaya, East Java. Adesiyun and Cazaban (1996) obtained serum samples from livestock (cattle, chickens, pigs, sheep, goats and water buffaloes) slaughtered at various slaughter houses in Trinidad were screened for agglutinins to three zoonosis causing pathogens. Of 153 pig sera examined serologically, no serum was positive for *Brucella*.

### Methodology

The objective of the study were to detect antibody against *Brucella* in pig sera and to give clear insight about *Brucella* infection and its public health hazards.

Serum samples were collected from a total of 190 slaughter pigs in Koteshwor and Talchhikhel areas in the Kathmandu valley for the serological study of prevalence of brucellosis in swines from June to December 2005. Brewer Diagnostic Card was used for the tests.

This study was supported by International Development Research Centre (IDRC) Ottawa Canada and International Foundation for Science (IFS), Sweden.

### Brucellosis Card Test

The brucellosis card test is a macroscopic, agglutination procedure procedure utilizing disposable materials, a stained buffered whole cell antigen suspension of *Brucella abortus* strain and contained in compact kits of minimal size. The card test for brucellosis is a rapid, sensitive and reliable procedure for detecting serologic evidence of *Brucella* infection. This test has sensitivity of 88.61% and specificity of 98.59% in cattle in India (Chakraborty et al., 2000 as cited by Dhakal et al., 2005). Brucellosis card test is said to be the principal means of diagnosis of brucellosis in pigs too (Aiello, 1998).

### Performance of Brucellosis Card Test

Rubber bulb was attached to capillary tube then 0.03 ml of serum (up to the black mark) was drawn into it from the serum containing vial. It was then placed on to one 'tear drop' test area of the Brewer Diagnostic Card by compressing the rubber bulb. The antigen dispensing bottle was shaken before use and holding in a vertical position, exactly two drops (0.03 ml) of antigen suspension was dropped on to each teardrop test area adjacent to, but not on the serum. The antigen suspension was mixed with test specimen using a clean stirrer and spread over entire 'tear drop' test area. A clean stirrer was used for each 'tear drop'. The card was rocked slowly (approximately 12 to and fro motions per minute) for the entire four minute incubation period, allowing time for the mixture alternately to flow into apex so that particles will be in close proximity and then, to spread out as it flows away from the apex. The card test was read in the 'wet' state immediately at the end of the four-minute incubation period

together with positive and negative control samples. A strongly positive reaction was indicated by the formation of characteristic agglutination, moderate to large clump. The test was negative if the specimen shows a pattern of dispersed particles without characteristic clumps. All the test procedures are based on standard technique mentioned by USDA (United States Department of Agriculture) APHIS veterinary services (Brucellosis Card Test Protocol, 1987).

### Results and Discussion

Out of serum samples 190 slaughter pigs tested for brucellosis, 41 were found to be positive. i.e. 21.58% of the total serum samples tested were found to be positive. The following table clarifies the result.

Table 4. Result of brucellosis card test of the swine serum samples

	Number of samples	Percentage
Card Test positive	41	21.58
Card Test negative	149	78.42

Thus the prevalence of brucellosis in pigs obtained from this study (i.e. 21.58%) is found to be in contrast with the finding 1.2% brucellosis in pigs of Mrunalini and Ranasastri (1999) and the finding of 0% prevalence of brucellosis in slaughter pigs in Trinidad by Adesiyun and Cazabon (1996).

On the other hand, it is closer to the finding of Van Der and Priadi (1988) of 13.1% prevalence of brucellosis in pigs slaughtered in Kapuk Jakarta, West Java and 15.09% of pigs slaughtered in Surabaya, East Java. Similarly, the finding of this study has been very close to the 23.4% prevalence in feral pigs in Florida as studied by Van Der Leek et al. (1993).

However, the prevalence as disclosed in slaughter pigs from this study is quite higher than that in the slaughter goats (5.36%) and in slaughter buffaloes (2.86%) as revealed by the study of Dhakal (2005) in the Chitwan district.

Similarly, it (21.58%) has been found to be alarmingly higher than that in humans (2.7%) as revealed by the study of Joshi (1984). Likewise, there's no point in comparing its prevalence (21.58%) with those in sheep and goat (3.64%) and in cattle and buffalo (8.7%) as shown by Joshi (1983).

The result of this study has been found to be even higher than that in the dogs (10%) in the Kathmandu valley as presented by Gurung (2003).

But this prevalence is quite closer to that in the yaks and chauris (17.6%) as suggested by Lefkowitz (2003).

On result analysis on the basis of age group, out of 29 pigs of the age group 5-7 months, 10 were sero-positive. Out of 99 pigs of the age group 8-10 months, 21 were sero-positive while out of 62 pigs of 11-13 months age group, 10 were sero-positive. The result is presented in the following table.

Table 5. Age-wise prevalence of brucellosis in slaughter swines

Age group (mths)	Number of pigs	Positive	Positive p.c.
5-7	29	10	34.48
8-10	99	21	21.21
11-13	62	10	16.13

As regards the age group, the prevalence of brucellosis was found to be the highest (34.48%) in the age group of 5-7 months which was found to decrease with age. The prevalence of the disease in the age group of 8-10 months was however found to be 21.21% and that in the age group of 11-13 months even less at 16.13%. As for the prevalence of brucellosis in pigs according to their site of slaughter, it was 21.43% (9 out of 42) in Koteshwor while it was 21.62% (32 out of 148) in Talchhikhel. It can be presented as follows.

Table 6. Prevalence of brucellosis in pigs on the basis of slaughter sites

Slaughter sites	Number of samples taken	Positive (Percent)
Koteshwor	42	9 (21.43%)
Talchhikhel	148	32 (21.62%)

According to the sites of slaughter, no significant difference was noticed in the prevalence of brucellosis in the slaughter swines. The prevalence of the disease in the slaughter pigs Koteshwor (21.43%) was found to be more or less similar to that in the slaughter pigs in Talchhikhel (21.62%).

### Conclusion and Recommendation

Thus, the sero-prevalence of brucellosis in the slaughter swines in the Kathmandu valley was found to be 21.58% which is really high as compared to that in other animals and in other parts of the world except a few instances. So, a lot of precautionary measures are to be taken to check the acquisition of this disease. The best way to control it would be test the animals in a farm in a herd and to slaughter and dispose it off if found positive. But due to the poverty, it does not seem practical in our context.

Thus the following recommendations are made to fight this disease.

- Regular sero-monitoring of the animals of the herd is to be carried out.
- Positive reactors must not be used in breeding and should be isolated from the herd. Replacements should be made with animals free of brucellosis.
- Feeders and mangers should be managed such that they escape contamination from semen, vaginal discharges or urine.
- Caution should be taken in purchase of individual pigs unless the status of the entire herd of origin is known.
- People involved in pig husbandry and pork handlers should be cautious not to do anything without gloves if there is any suspicion of brucellosis.
- Strict quarantine measures should be brought into play.
- Programs to raise awareness about this disease should be conducted.

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#### RECOMMENDATION OF SEMINAR ON PRESENT SITUATION CHALLENGES IN TREATMENT AND ELIMINATION OF TAENIASIS/CYSTICERCOSIS IN NEPAL

##### Summary Report

1. Total number of expected delegates – 76
2. Total number of registered delegates – 52
3. Total number of expected paper for presentation – 33
4. Total number of paper presented – 26  
of which different categories papers were:
  - 4.1 Epidemiological Aspect – 9
  - 4.2 Clinical aspect – 5
  - 4.3 Laboratory diagnostic aspect – 2
  - 4.4 Pig husbandry production and marketing management aspect – 5

- 4.5 Legislation aspect – 1
- 4.6 Sociological aspect – 1
- 4.7 WHO Global aspect – 1
- 4.8 SAARC Aspect – 1
- 4.9 Network establishment aspect – 1

5. Establishment of a national network working group (NNWG) for control of Cestode Zoonoses: Cysticercosis/Taeniasis and Echinococcosis/Hydatidosis (TCEH) both in Humans and Animals in Nepal was recommended with the following composition of the members

##### Composition of Group

- a. Director Epidemiology and DCD, DHS
- b. Director Animal Health Directorate DLS
- c. Representative from Medical College
- d. Representative from Veterinary College
- e. Representative from Private Hospital and Nursing Homes
- f. Representative, Nepal Agriculture Research Council (NARC)
- g. Representative, Nepal Health Research Council (NHRC)
- h. Representative, National Planning Commission
- i. Representative, Ministry of Finance
- j. Representative, Union of all Municipalities in Nepal
- k. Executive Chairman, NZFHRC

**N.B.:** Terms of reference (TOR) and work plan of this NNWG for TCEH will be formulated by this group itself. Secretariat of this group will be in NZFHRC office Chagal, Kathmandu, Nepal.

##### LIST OF PUBLICATIONS BY NZFHRC WITH ISBN NUMBER (Continued....)

S. N.	Name of Book	Langu age	ISBN Number
73	पश्चिमाञ्चल क्षेत्रीय स्वच्छ स्वस्थ पशु वध प्रकृया मासु जाँच व्यवस्थापन तालिम प्रतिवेदन	नेपाली	99933-47-70- 4
74	स्वच्छ स्वस्थ पशुवध प्रकृया व्यवस्थापन निर्देशिका पुस्तिका	नेपाली	99933-49-54-2
75	गौगोटी रोग नियन्त्रण कार्यमा कार्यरत व्यक्तिहरुको लागि प्रयोगात्मक गाइड	नेपाली	99933-29-14-2
76	फोहोर मैलायुक्त खेर गएको पानी तथा मलमुत्रलाई कृषि तथा जलचर पालनमा सुरक्षित उपयोग सम्बन्धी मार्गदर्शन	नेपाली	99933-29-15-0
77	जोखिम विश्लेषण संकट नियन्त्रण परिक्षण प्रणाली (खाद्य संरक्षण खाद्य उत्पादन संग सम्बन्धीत जोखिमहरु पत्ता लगाउने र त्यसबाट उत्पन्न खतराको निक्कौल गर्ने कार्य सम्बन्धी मार्ग दर्शिका)	नेपाली	99933-29-22-3
78	ग्रामिण विकासका सहभागिताको अनुगमन तथा मूल्याङ्कन	नेपाली	99933-29-26-6
79	वातावरणीय जनस्वास्थ्य चेतना तालिम पुस्तिका	नेपाली	99933-49-76-3
80	शहभागीमूलक शहरी लेखाजोखा	नेपाली	99933-49-79-8

	तालिम प्रतिबेदन		
81	नेपालमा पशु बधशाला र मासु बजारको बर्तमान स्थिति तथा व्यवस्थापन	नेपाली	99933-49-75-5
82	सरोकारवाला समूहहरुको विधान	नेपाली	99933-49-86-0
83	पशु बध तथा मासु बजार व्यवस्थापन तालिम	नेपाली	99933-49-93-3
84	सरोकारवाला समूहहरुको आ.व. २०६१/०६२ को वार्षिक विकास कार्य योजनाहरु	नेपाली	99933-49-94-1
85	School Health Situation in Wards no. 19 and 20 of KMC. Urban Ecosystem Health Project Phase II	English	99933-49-81-X
86	Basic Laboratory Training Practices	English	99933-49-82-8
87	Proceeding on Drinking Water Quality Monitoring Technology Transfer Training	English	99933-49-83-6
88	Training Report on Participatory Urban Appraisal (PUA)	English	99933-49-78-X
89	Socio-Demographic Environment and Health Status in Wards 19 and 20 of KMC. Urban Ecosystem Health Project Phase-I	English	99933-49-80-1
90	Demographic Family Health Survey in Ward 19 and 20 of KMC	English	99933-49-87-9
91	Dog Rabies Immunization in Pokhara and Lekhnath, Kaski District	English	99933-49-84-4
92	Gender Sensitization Workshop for the Stakeholder of KMC	English	99933-49-88-7
93	First Annual Progress Report of Urban Ecosystem Health Project, Phase- II Ward 19 and 20 of KMC	English	99933-49-85-2
94	Ecosystem Health Project Identification & Preparation	English	99933-49-89-5
95	Impact Assessment	English	99933-49-90-9

	Workshop on The Achievement of Urban Ecosystem Health Project Wards No. 19 & 20 of KMC	h	
96	Dog Rabies Immunization In Siddhartha Nagar and Butwal Municipalities Of Rupandehi District	English	99933-49-95-X
97	Final Report on Public Schools Drinking Water Management Project for Kathmandu ADPs Working Area	English	99933-49-98-4
98	Validation of Diagnostic Techniques for Porcine Cysticercosis in Nepal	English	99933-49-97-6
99	Second Annual Progress Report Urban Eco-System Health Project, Phase – II	English	99933-49-96-8
100	Participatory Monitoring and Evaluation Workshop Report.	English	99933-49-99-2

#### **NEWS:**

*KDMA research award for the year 2062 (2005) was awarded with Rs. 10,001/- to Prof. Dr. Rishendra Verma, Head and Government Analyst, India Division of Biological Standardization, Indian Veterinary Research Institute, Izatnagar – 243 122 (UP), India by the Chairman of KDMA Research Trust Dr. D. D. Joshi and Chief Guest of the National Seminar on Taeniasis/Cysticercosis Secretary, Ministry of Agriculture and Co-operatives Mr. Ganesh Bahadur K. C. jointly.*

*Dr. D. D. Joshi and Ms. Minu Sharma are going to participate in Annual Conference of the ISMOCD-Agra, India 11-13 February 2006. Dr. Joshi will present a paper on "Visceral Leishmaniasis Outbreaks in Nepal During the Year 1980-2003."*

*Dr. D. D. Joshi will be participating 8<sup>th</sup> Nepal Veterinary Association (NVA) conference from February 15-17, 2006 in Kathmandu. He will be presenting a paper on "Animal Welfare Issues and Future Strategy".*

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**TO:**

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