

SHORT COMMUNICATION

ZOONOTIC DISEASES DIAGNOSED FROM JAN 2016 TO AUG 2017 IN REGIONAL VETERINARY LABORATORIES, DEPARTMENT OF VETERINARY SERVICES, MALAYSIA

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ABSTRACT. Infectious diseases of livestock are a major threat to global animal health and welfare and their effective control is crucial for agronomic health, for safeguarding and securing national and international food supplies and for alleviating rural poverty in developing countries. Some devastating livestock diseases are endemic in many parts of the world and threats from old and new pathogens continue to emerge, with changes to global climate, agricultural practices and demography presenting conditions that are especially favourable for the spread of arthropod-borne diseases into new geographical areas. Zoonotic infections that are transmissible either directly or indirectly between animals and humans are on the increase and pose significant additional threats to human health and the current pandemic status of new influenza A (H1N1) is a topical example of the challenge

presented by zoonotic viruses (Tomley and Shirley, 2009). Malaysia, being one of the members of the World Organisation for Animal Health (OIE) which is responsible for setting standards for control of animal diseases. For year 2017, the list included 116 animal diseases, infections and infestations, many of which are zoonotic in nature. As such, this paper discusses the common zoonotic infections diagnosed in the five Regional Veterinary Laboratories which are spread across the country and entrusted to carry out diagnostic tests to aid in the treatment and control of animal diseases. A total of almost half a million samples were tested comprising more than a million tests to help the Department of Veterinary Services control and eradicate economically important diseases to safeguard the animal population. Of these, zoonotic diseases comprise a small but significant entity which

needs careful attention (Chandrawathani *et al.*, 2017)

Dora Tan (1981) reported that among the many zoonotic diseases prevalent in Malaysia, are leptospirosis, rabies, influenza, Japanese encephalitis, toxoplasmosis, ornithosis, Q fever and monkeypox which have been investigated at the Institute for Medical Research, Kuala Lumpur. The regional laboratories have full capability to conduct tests to confirm parasitic, viral and bacterial infections except for rabies and avian influenza, which was diagnosed in the Veterinary Research Institute. However, preliminary tests for avian influenza was carried out in regional laboratories.

Keywords: zoonotic diseases, parasitic, bacterial, viral, livestock

METHODS AND RESULTS

The diagnoses of animal diseases was conducted at five regional veterinary laboratories, that is, Makmal Veterinar Kawasan (MVK) or Regional Veterinary Laboratory of the Department of Veterinary Services Malaysia namely: MVK Kota Baru, MVK Kuantan, MVK Bukit Tengah, MVK Wilayah Tengah and MVK Johor Bahru. Samples were submitted to the laboratory by farmers or veterinarians based on clinical evidence of disease and subsequently, tested as required based on methods by OIE (<http://www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2017/>). The respective owner of the livestock were informed of the results within a stipulated time period to facilitate treatment and control of the disease. Table 1 shows the zoonotic infections diagnosed

by the laboratories from January 2016 to August 2017. *Toxocara* sp. Infections were reported in four laboratory cats either in faeces or post-mortem findings. Other zoonotic parasites include *Notoedres* sp. and *Toxoplasma* sp. albeit few in number of samples. *Fasciola* sp. was also reported as it has a zoonotic potential and can be commonly found in cattle (Saleha, 1991). Among the bacterial diseases, it was noted that Salmonellosis, Brucellosis, Melioidosis, Q fever and Tuberculosis were diagnosed in the five regional laboratories indicating the importance of these as zoonoses. Brucellosis was seen in cattle and goats and Salmonellosis was seen in poultry. The viral diseases diagnosed was mainly Newcastle disease from all laboratories and highly pathogenic avian influenza from MVK Kota Baru in 2017 due to the localised outbreak in Kelantan.

DISCUSSION

Diseases of animal origin that can be transmitted to humans, such as avian influenza, rabies and brucellosis, pose worldwide risks to public health. Other diseases which are mainly transmitted from person to person, also circulate in animals or have an animal reservoir. These can cause serious health emergencies, such as the recent epidemic of Ebola virus. The risks increase with globalisation, climate change and changes in human behaviour, giving pathogens numerous opportunities to colonise new territories and evolve into new forms.

As human health and animal health are interdependent and bound to the health

Table 1. Summary of zoonotic parasitic, bacterial and viral disease.

Regional Laboratory	Diseases	Organism/Disease	Host species 2016	Total No. of samples (positive samples) 2016	Host species (2017)	Total No. of samples (positive samples) 2017 (up to aug)
MVK Kota Baru	Parasitic Diseases	<i>Toxocara</i>			CAT	1(1)
	Bacterial Diseases	<i>Brucella abortus</i>	BUFFALO	15(2)	CATTLE	390(34)
			CATTLE	287(125)	BUFFALO	4(2)
		<i>Brucella melitensis</i>	SHEEP	37(8)	SHEEP	58(0)
			GOAT	300(27)	GOAT	328(4)
			CATTLE	2(1)	CATTLE	5(0)
		<i>Burkholderia pseudomallei</i>	SHEEP	30(8)	SHEEP	112(12)
			GOAT	80(1)	GOAT	112(4)
			POULTRY	102(17)	POULTRY	15(2)
		Salmonella	DUCK	38(22)	DUCK	15(2)
			AVIAN	68(7)		
	Q-Fever		GOAT	46(9)		
	Viral Diseases	HPAI (AI +VE)	POULTRY	157(1)	POULTRY	1351(14)
			POULTRY		POULTRY	182(4)
		HPAI (H5+VE)	POULTRY		POULTRY	1351(12)
					DUCK	98(1)
		HPAI +VE (H5N1)	POULTRY		POULTRY	1351(12)
HPAI (ND+VE)	POULTRY		POULTRY	1351(5)		

Regional Laboratory	Diseases	Organism/Disease	Host species 2016	Total No. of samples (positive samples) 2016	Host species (2017)	Total No. of samples (positive samples) 2017 (up to aug)
MVK Kuantan	Parasitic Diseases	<i>Toxocara Cati</i>	CAT	1 (1)		
		<i>Toxocara Cati</i>	CAT	1 (1)		
		<i>Fasciola gigantica</i>	CAT	1 (1)		
	Bacterial Diseases	<i>Salmonella Saintpaul</i>	POULTRY	1(1)	Colibacillosis (DEER)	1 (1)
		<i>Salmonella Gallinarum</i>	POULTRY	1 (1)		
		<i>Salmonella spp</i>	POULTRY	3 (3)		
		<i>Salmonella Bargny</i>	POULTRY	1 (1)	Brucella (CATTLE)	29 (3)
		<i>Salmonella Brancaster</i>	POULTRY	5 (5)		
			DUCK	1(1)		
		<i>Salmonella Convalis</i>	POULTRY	1(1)		
		<i>Salmonella Tokoradi</i>	POULTRY	2 (2)		
		<i>Salmonella Weltevreden</i>	POULTRY	2(2)		
			SWIFTLET	1(1)		
		<i>Salmonella Fortunebourn</i>	POULTRY	1(1)		
		<i>Salmonella Lezenne</i>	POULTRY	1(1)		
<i>Salmonella Thyphimurium</i>	POULTRY	2(2)				
Viral Diseases	Newcastle Disease			POULTRY	13 (0)	

Regional Laboratory	Diseases	Organism/Disease	Host species 2016	Total No. of samples (positive samples) 2016	Host species (2017)	Total No. of samples (positive samples) 2017 (up to aug)		
MVK Bukit Tengah	Parasitic Diseases	<i>Fasciola</i> sp.	GOAT	1(1)				
		<i>Toxocara cati</i>	CAT	1(1)				
	Bacterial Diseases	<i>Salmonella</i> sp.		POULTRY	51(5)	POULTRY	100(3)	
				AVIAN	85(12)	AVIAN	75(4)	
						DUCK	80(4)	
			<i>Burkholderia pseudomallei</i>				GOAT	11(1)
		Brucellosis (serology)		CATTLE	239(62)	CATTLE	80(33)	
				GOAT	41(17)	GOAT	15(10)	
				SHEEP	5(5)	SHEEP	6(4)	
				BUFFALO	2(1)	PIG	35(14)	
			Tuberculosis (BOVIGAM)	CATTLE	4(3)	CATTLE	5(2)	
			Q-fever (serology)		GOAT	38(6)	GOAT	31(2)
				CATTLE	3(1)			
		Viral Diseases	Newcastle Disease	AVIAN	120(24)	AVIAN	12(4)	
		MVK Wilayah Tengah	Parasitic Diseases	<i>Toxocara</i> sp.			DOG	1(1)
Bacterial Diseases	<i>B. abortus</i>		CATTLE	371(110)	CATTLE	215 (71)		
	<i>Bru. melitensis</i>		GOAT	36 (19)	GOAT	35 (12)		
	Tuberculosis		CATTLE	147 (28)	CATTLE	378 (39)		
	Q Fever		GOAT	4 (1)	GOAT	11 (3)		
	<i>Burkholderia pseudomallei</i>			ALPACA	6(1)			
				BOVINE	1(1)			
			CAPRINE	1(1)				
Viral Diseases	Newcastle Disease (ND)	AVIAN	1064(60)	AVIAN	502(6)			

Regional Laboratory	Diseases	Organism/Disease	Host species 2016	Total No. of samples (positive samples) 2016	Host species (2017)	Total No. of samples (positive samples) 2017 (up to aug)
MVK Johor Bahru	Parasitic Diseases	Toxoplasmosis	CAT	2(2)		
	Bacterial Diseases	<i>Burkholderia pseudomallei</i>	CATTLE	5(1)	CATTLE	5(1)
		<i>Coxiella burnetii</i>			RABBIT	7(5)
					CATTLE	1(1)
	<i>Cryptococcus neoformans</i>	AVIAN	17(1)			
Viral Disease	Newcastle Disease	POULTRY	10(4)	POULTRY	10(1)	

of the ecosystems in which they exist, it is important that a One Health concept be inculcated to combat zoonotic diseases. This concept is envisaged and implemented by the OIE as a collaborative global approach to understanding risks for human and animal health (including both domestic animals and wildlife) and ecosystem health as a whole. Zamri Saad and Kamaruddin (2016) have reported brucellosis as 4-5% in bovines which could potentially infect humans through milk and contaminants in the farm. Salmonellosis has also been reported by Nidaullah *et al.* (2017) and poses a significant finding in poultry as shown in the laboratory diagnoses. Nidaullah further reported Salmonella serotypes were isolated from 161 out of 182 samples (88.46%) with 100% prevalence in whole chicken carcasses and chicken cuts – as well as transport crates, cages, drums, knives, chopping boards,

display tables, floors, bench wash water, wash water and drain water. Salmonella was isolated from 91.67%, 83.33%, and 66.67% of defeathering machines, drain swabs, and aprons, respectively. 17 serotypes were isolated in this study with Salmonella Albany (57/161), Salmonella Corvallis (42/161) and Salmonella Brancaster (37/161) being the predominant serovars. Leow *et al.* (2011) reported that Newcastle disease commonly occurs throughout the year in a study from 2004 to 2006, and it is largely dependent on the status of vaccination and presence of other concurrent diseases in the poultry.

The samples sent for diagnosis in the regional laboratories were dependent on requests from the field veterinarians. As such, this information may vary from year to year. From the information gathered in this paper, it can be concluded that the common viral diseases diagnosed for 2016

and 2017 are Newcastle disease and Avian Influenza, which was confirmed by the Veterinary Research institute. The bacterial diseases were salmonellosis, brucellosis and melioidosis. The least common was parasitic infections namely *Toxocara* infections in cats. The tasks of the regional laboratories are important in gauging current diseases occurring in the farms or among pets. These are the earliest signs of an impending outbreak and it is important to monitor all cases submitted for diagnosis.

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