The 4th FAO-APHCA/OIE/DLD Regional Workshop
on Brucellosis Diagnosis and Control in Asia-Pacific Region
- Proficiency Test and Ways Forward- Chiang Mai, Thailand, 18-21 March 2014

Brucellosis situation in Mongolia and Result of Bovine Brucellosis Proficiency Test

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INTRODUCTION

➢ Mongolia is a large, landlocked and sparcely populated country in central Asia.   Population -2.9 million, 2013

➢ It was a communist country with strong links to the USSR from 1921 until 1990 but is now a democratic independent state with a burgeoning market economy.

➢ Mongolian society is traditionally based on nomadic livestock rearing. There are 146000 herding families rearing a domestic animal (camel, horse, cattle, sheep/goat).

➢ In 2013, cashmere-7.3thous.ton, wool-21thous.ton, hide-1 mil., skin-9 mil., meat-250 th. ton, milk-400 mil.liter.

I. Livestock population

■ **the end 2013** *(thous)*

camel - 321.0

horse - 2616.2

cattle - 2905.3

sheep - 20036.6

goat - 19196.7

Total - 45075.7
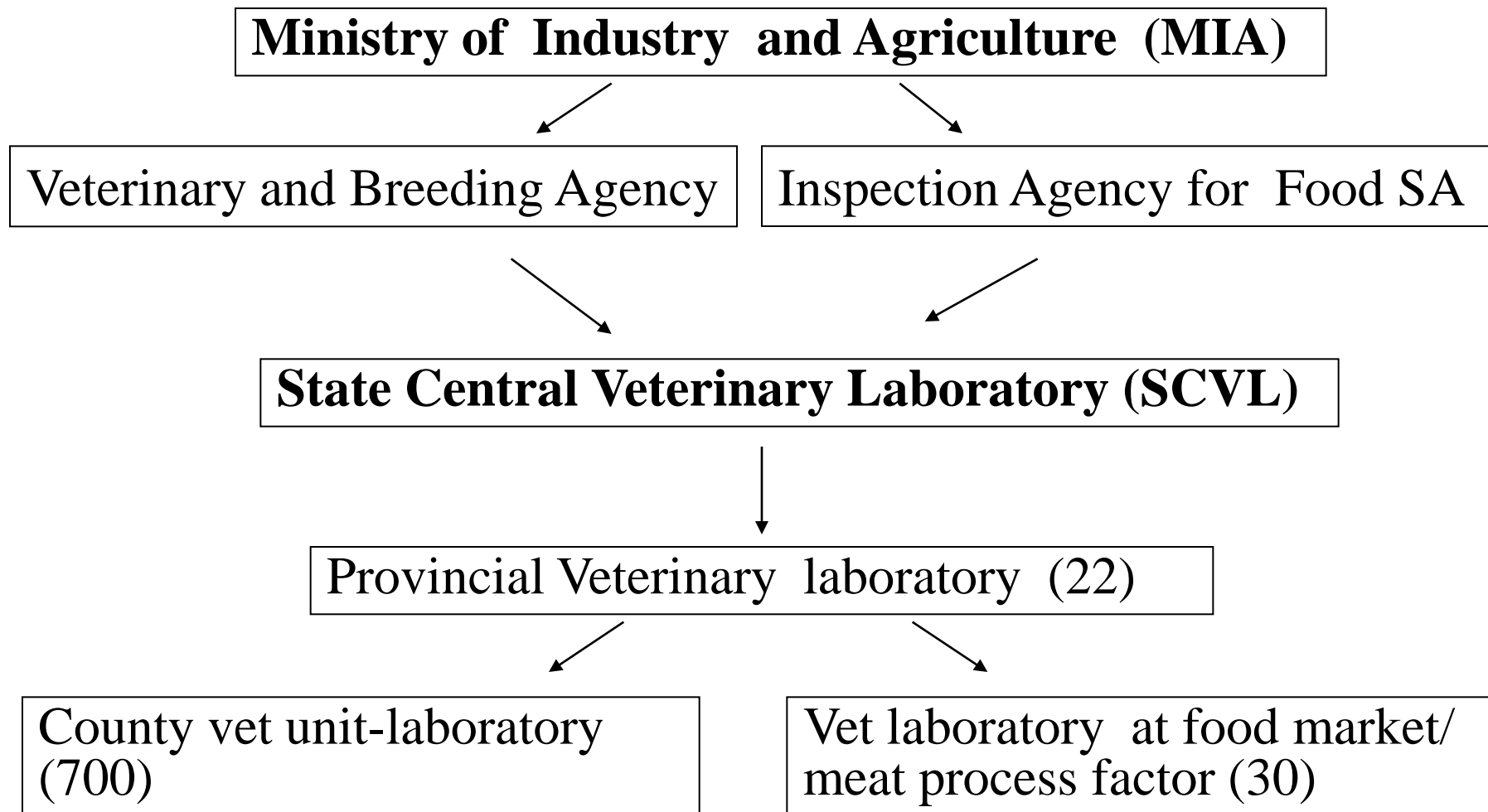
reindeer - 1511
herder family-146.0

2013

camel	
horse	
cattle	
sheep	
goat	

0.7% 5.8% 6.4%
42.6%
44.5%
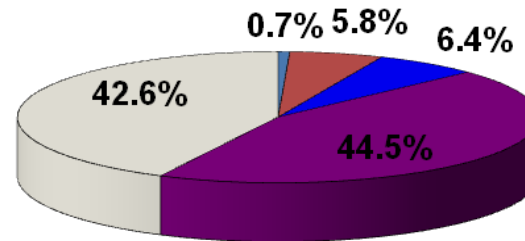
- Mongolian livestock are known to be infected with *B. abortus* and *B. mel.,* 500-600 cases of human brucellosis diagnosed every year. Brucellosis causes significant economic loss to the health and agricultural sectors. 23 zoonoses, brucellosis is 0.7% of IDs. In last decade, a human case is 3.7/10000 (4-16 in some province).

- Until 1987 there was an active detection and eradication campaign against the disease, however control measures were relaxed during the transition from communism to capitalism in the 1990's and brucellosis infection rates rose.

- A vaccination campaign was started in 2000, female cattle under the age of 6 months-**strain-19**, female sheep/goats are vaccinated by **Rev-1**. This campaign has led to an overall decrease in the level of brucellosis, but there stay persistent pockets of disease.

- The vaccination is going from 2010 by region except one: 1st year-all animal except breed male- M, 2nd, 3rd-young -Y, 4th-M, next-Y. In 2010, 6204.4, 2013-19443.4 th. animals involved in vaccination.

Ministry of Industry and Agriculture (MIA)

Veterinary and Breeding Agency

Inspection Agency for Food SA

State Central Veterinary Laboratory (SCVL)

Provincial Veterinary laboratory (22)

County vet unit-laboratory (700)

Vet laboratory at food market/ meat process factor (30)

Diagnostic strategy in regard to Brucellosis

a. Government:
- "Livestock health" program 2000 and, "Mongol livestock" , 2010
- National Zoonoses Control Program, Livestock project- Pilot in 2 provinces and mass vaccination- by region, every year, 2010.2
- "One Health" Inter-sectoral commission, 2013.11, 2 meetings

b. Regional laboratories:
Brucellosis Elimination program: Each year 21 provinces were blood sampled and tested for brucellosis using of RBT and CFT. Provinces in central and eastern area had the most brucellosis infected animals.

c. State Central Veterinary Laboratory:
The Lab diagnoses samples to confirm and submitted from suspected brucellosis, also from animals requiring brucellosis-free certification. There has been a rise in the proportion of the submitted cases that are positive in the last years.
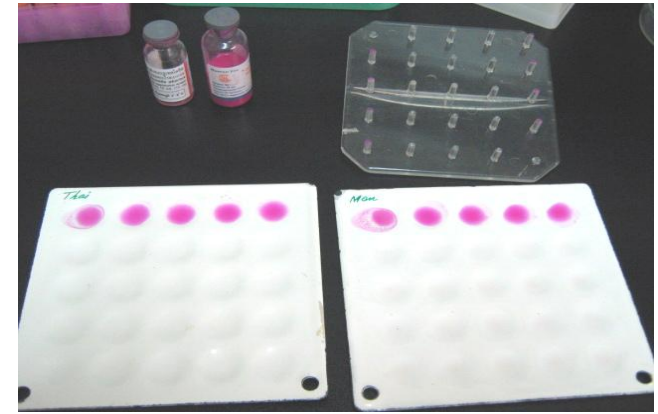
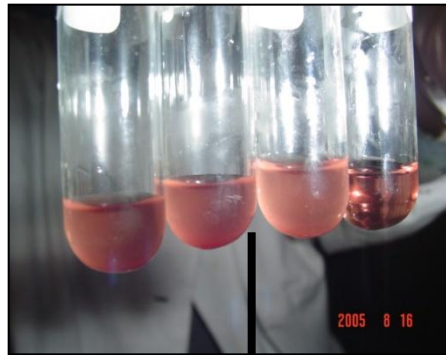# The Unit for Infectious Disease Diagnosis and Surveillance - Serology:
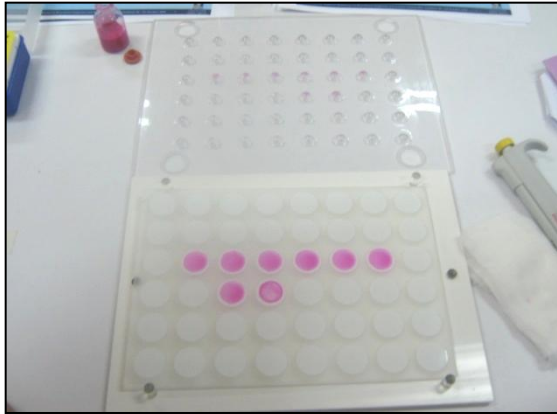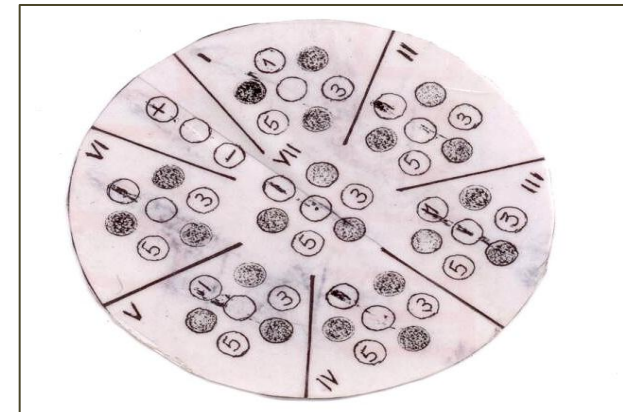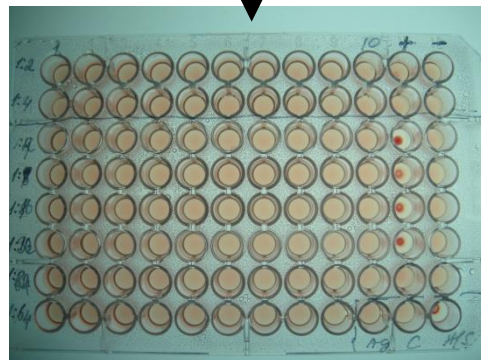

Standard-no finding
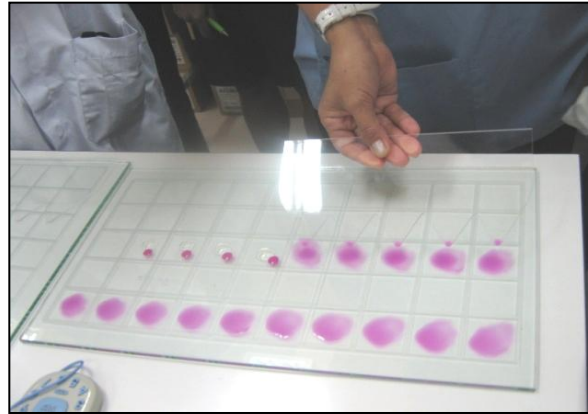
glass- in province

enamel - few, needed

CFT: 125 µl -volume is applicable than 150 µl in the lab and, also has used for diagnosis of Glanders and Dourine.

Brucellosis Mass Sero-survey   in the country

a. Regional laboratories:

In 2011 a total of 168 027 animals (camel, cattle, sheep, goat) from 22 areas were blood sampled and tested for brucellosis using RBT/CFT by the laboratories. Provinces in Mongolia had the most brucellosis-positive animals, but Gobi area is low from brucellosis.

b. State Central Veterinary Laboratory:

The Lab diagnoses samples confirmed the positives from the provinces and submitted from suspected brucellosis using RB, CFT/ELISA and from animals requiring brucellosis-free certification.

In 2013, also samples tested from positive and negative areas sero-bacteriology for the national serum bank and brucella strain-stock.

# Result of Sero-survey - Brucellosis Prevalence, 2011

	county	sub-county	herder family	total sample size
- Province 21/21	189/330 **57.3%**	343/1082 **31.7%**	926/11695 **7.9%**	1444/166285 **0.86%**

	district	sub-district	herder family	total-sample-size
- UB	4/8 **50%**	5/25 **20%**	12/34 **35.3%**	17/1742 **0.97%**

Over all 22	**193/338 57.1%**	**348/1107 31.4%**	**938/11729 8 %**	**1461/168027 0.87%**

	Total sample		camel		cattle		sheep		goat	
-RBT	1461/168027	**0.9%**	82/10937	**0.7**	666/36318	**1.8**	396/59946	**0.6**	317/60826	**0.5**
-ELISA	1101/1461	**0.7%** **75%**	75/82	**0.7** **91%**	565/666	**1.6** **85%**	269/396	**0.4** **68%**	192/317	**0.3** **61%**
-AGIDT	484/1387	**0.3%** **35%**	37/75	**0.3** **49%**	286/620	**0.8** **46%**	105/390	**0.2** **27%**	56/304	**0.1** **18%**

Result of Sero-survey- Brucellosis Prevalence, 2011

## *Brucellosis - by region*
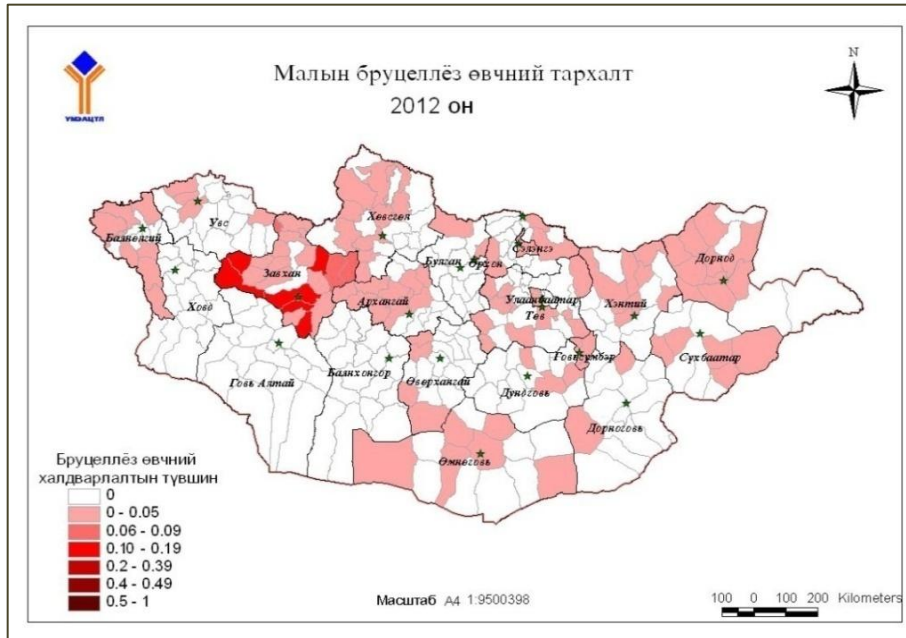
Brucellosis - by herder family
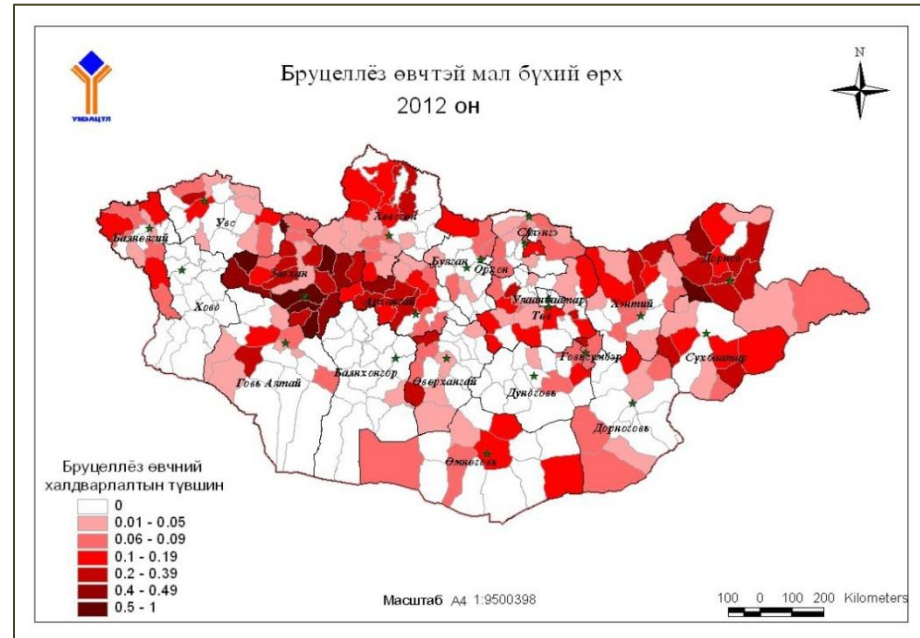
Provincially- **0.02 - 5%** (Bh, Kd, Za, Do),   County- **5-100%** (Bh, Kd, Gs, Da),
Sub-county - **1.6 -100%** (Bh, Kd, Gs, Za), Family- **0.2- 35%** (Bh, Kd, Za, UB, Do)

In average, all province were tested with pos, county- **57.1%,** sub-county- **31.4%,** herder family- **8.0%** with positive and,   **0.7%** with positive result of all tested animal *(camel-0.7%, cattle-1.6%, sheep-0.4%, goat-0.3%)*.

Result of Brucellosis Sero-surveillance - by animal, 2011
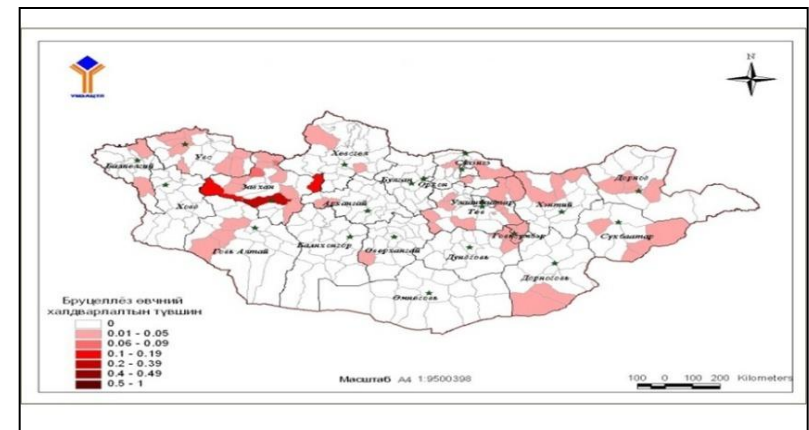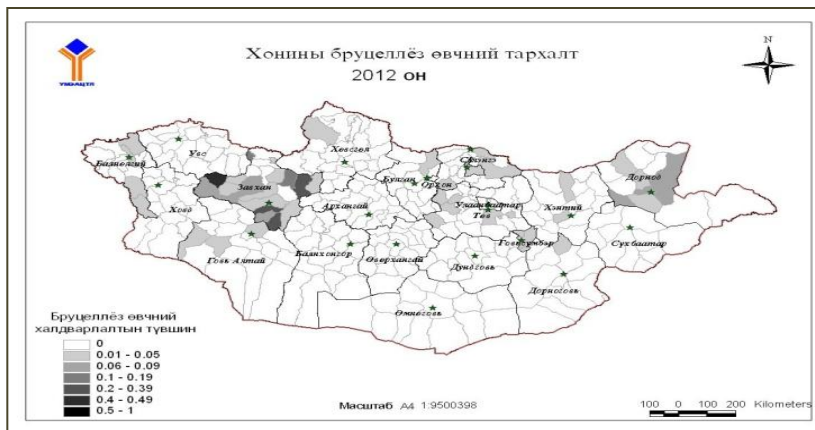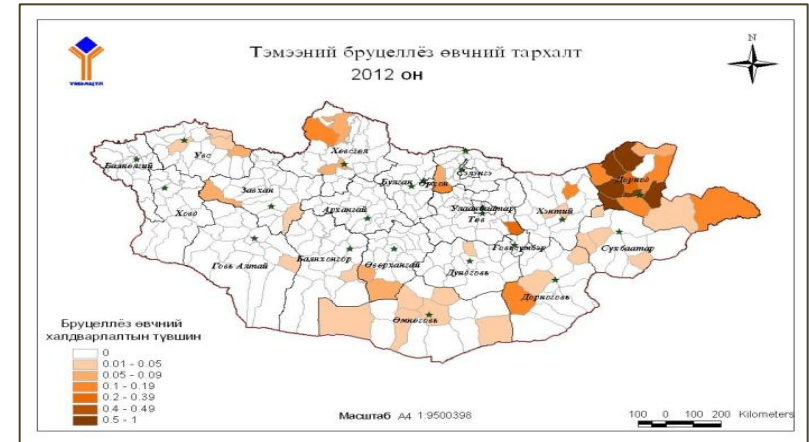
Cattle: 2 provinces (Bh, Og)- no positive, - Other 20 provinces - **0.1-5.8%**

Camel: 9 provinces- no positive, - Other 13 provinces- **0.2 - 5.9%**

Sheep: 5 provinces (Ar, Bh,Du,Og,Kd)-no positive, Other provinces- **0.1 - 5.7%**

Goat: 7 provinces (Ar,Bh,Bu,Da,Dg,Og,Kd)-no positive, Other province-**0.1-2.2%**

I. Serology: 4 provinces- active target investigation from pos and negative area

East province: tested pos % (RBT)

|	Total sample			camel			cattle			sheep			goat		
- Dornod	516	129	25.0	-			214	85	39.7	221	33	14.9	81	11	13.6
- Hentii	287	165	57.5	-			123	103	83.7	63	44	69.8	101	18	17.8
- Sukhbaatar	634	174	27.4	100	3		134	39	29.1	200	110	55.0	200	22	11.0
Total	**1437**	**468**	**32.6**	**100**	**3**		**471**	**227**	**48.2**	**484**	**187**	**38.6**	**382**	**51**	**13.3**
- DornoGobi	46	2					46	2							
- DundGobi- dog	10	2													
- OmnoGobi	**3872**	**10**	**0.26**	**500**	**-**		**498**	**8**	**1.6**	**1428**	**1**	**0.1**	**1446**	**1**	**0.1**

II. Bacteriology: Brucella isolaton -

- 175 samples-(swab70, milk105, 70 animal), 57 culture-25 cultured/specific- PCR:

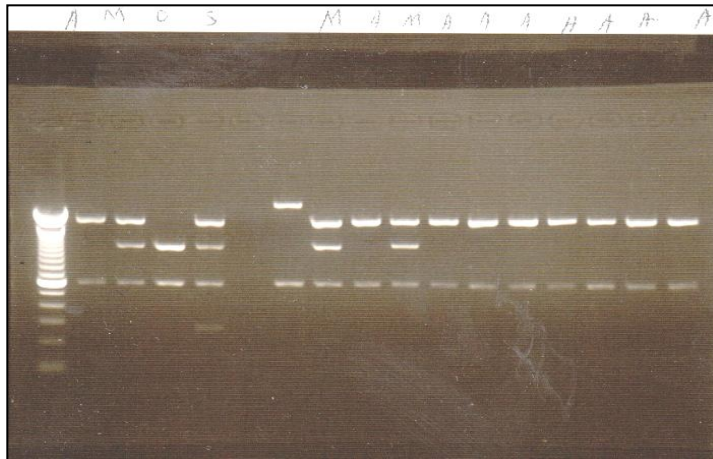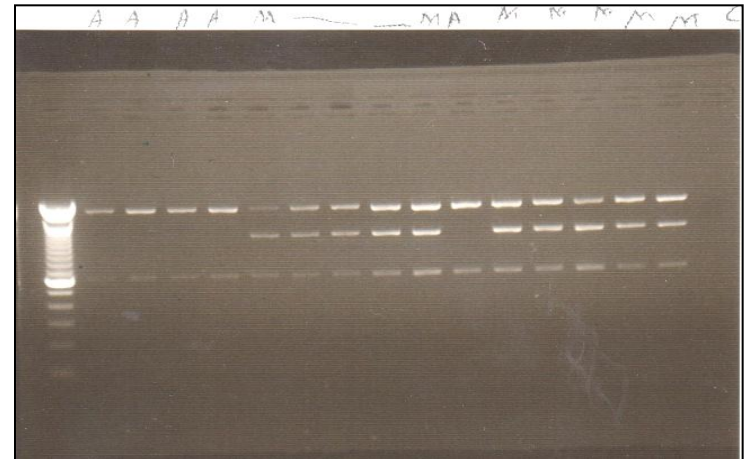| Province	B. mel.	B. abortus
- Dornod	6 sheep	8 cattle
- Hentii	-	5 cattle
- Sukhbaatar	4 sh/goat	2 cattle
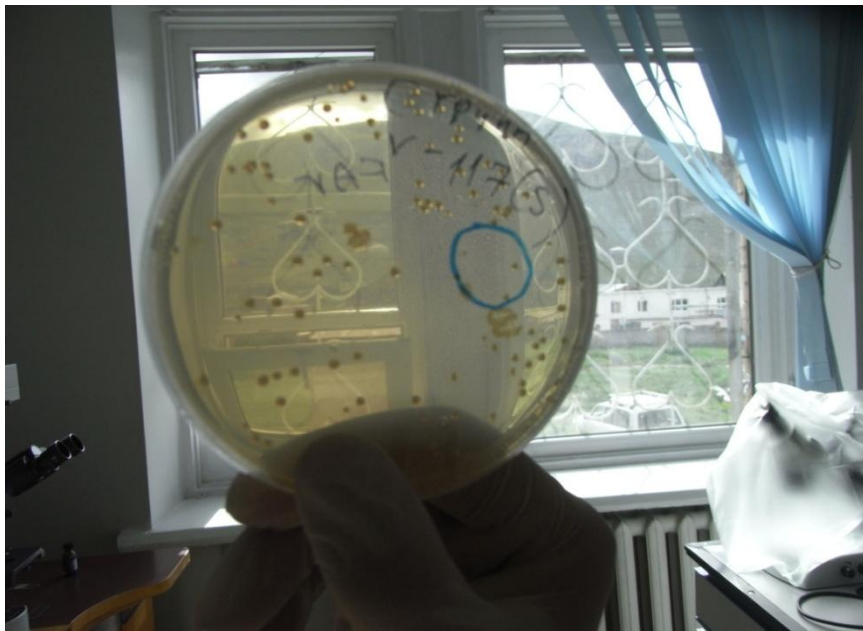
Brucell culture - CITA agar
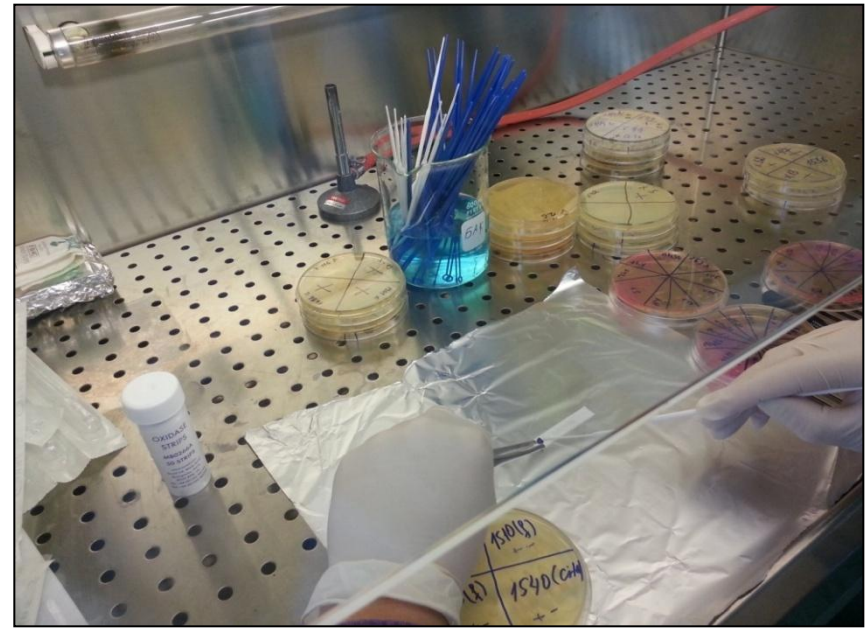
Ferment active - brucell culture

M C+ C+C+C+   1 2 3 4 5 6 7 8 9 10

M 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Agarose Gel Electrophoresis of mPCR product. Lane 1,3,5,6,7,8,9,11,12,13,14   *B. melitensis* (794, 994, 1500 pn),
Lane 2,4,5,6,7,8,9,10,1,2,3,4,10 *B. abortus*   (794, 1500 pn)

17 serum and 1 bottle Ag was received

		CFT		
		pos	neg	
RBT	pos	0	5	5
	neg	0	12	12
		0	17	17

Sen = 0/0+0= 0%
Sp   = 12/5+12= 70.6%

	Tested	pos	reaction
- RBT	17	5	+, ++ **weak**
- CFT	17	0	+ **weak**
- cELISA	17	10	PI 47-85%

		cELISA		
		pos	neg	
RBT	pos	5	0	5
	neg	5	7	12
		10	7	17

Sen= 5/5+5= 50
Sp = 7/0+7= 100

		cELISA		
		pos	neg	
CFT	pos	0	0	0
	neg	10	7	17
		10	7	17

Sen= 0/0+10= 0
Sp = 7/0+7= 100
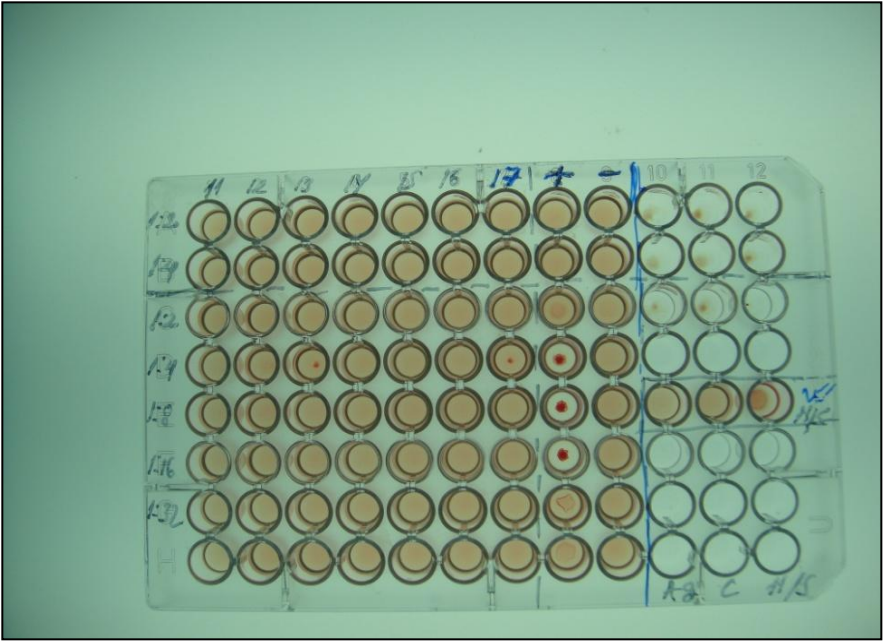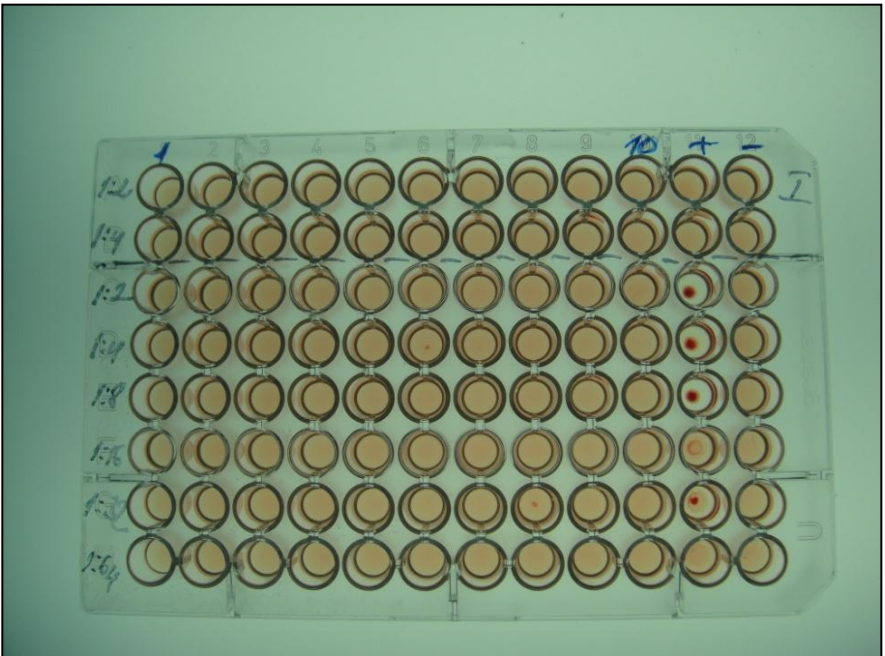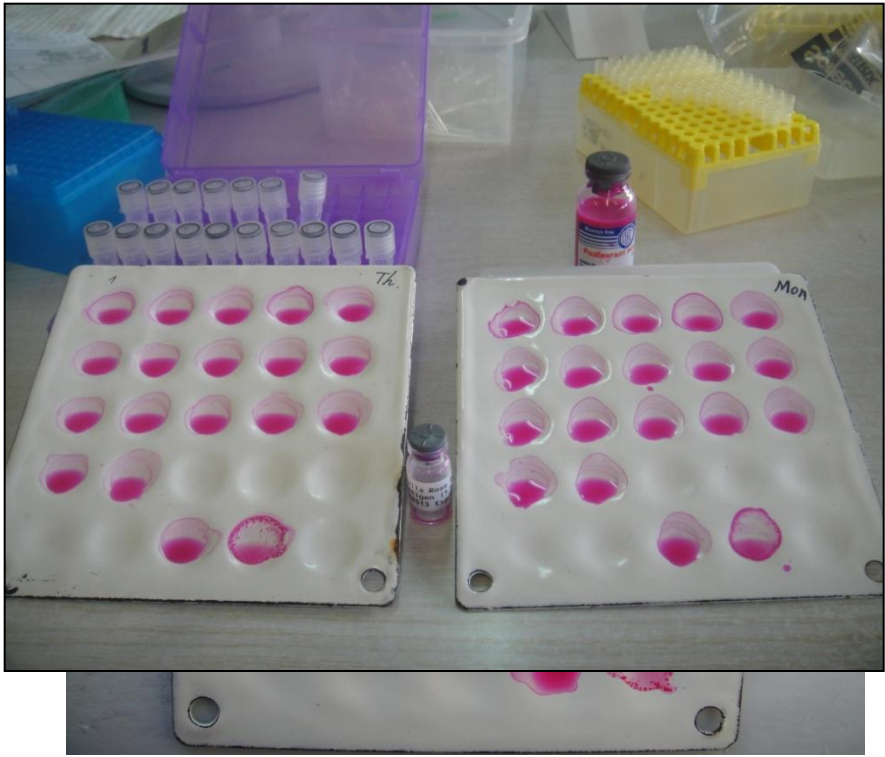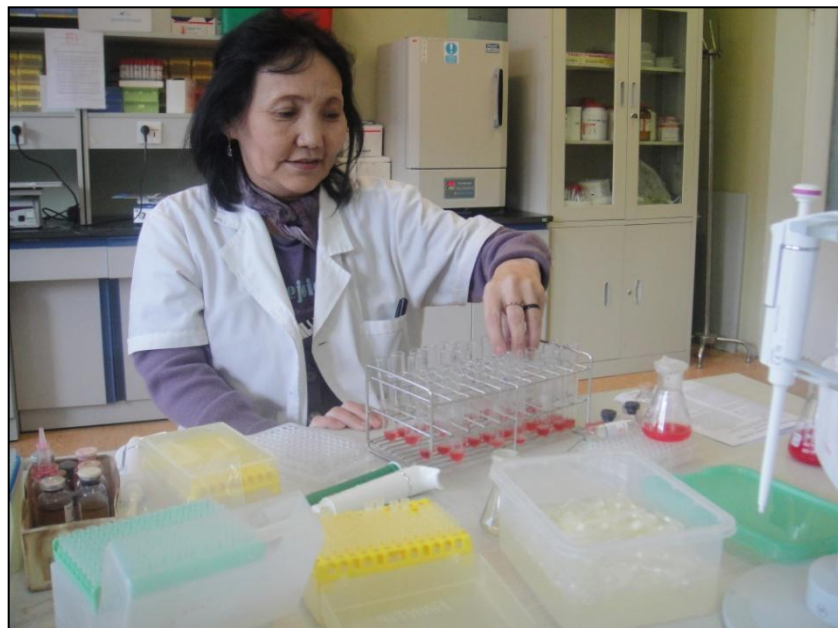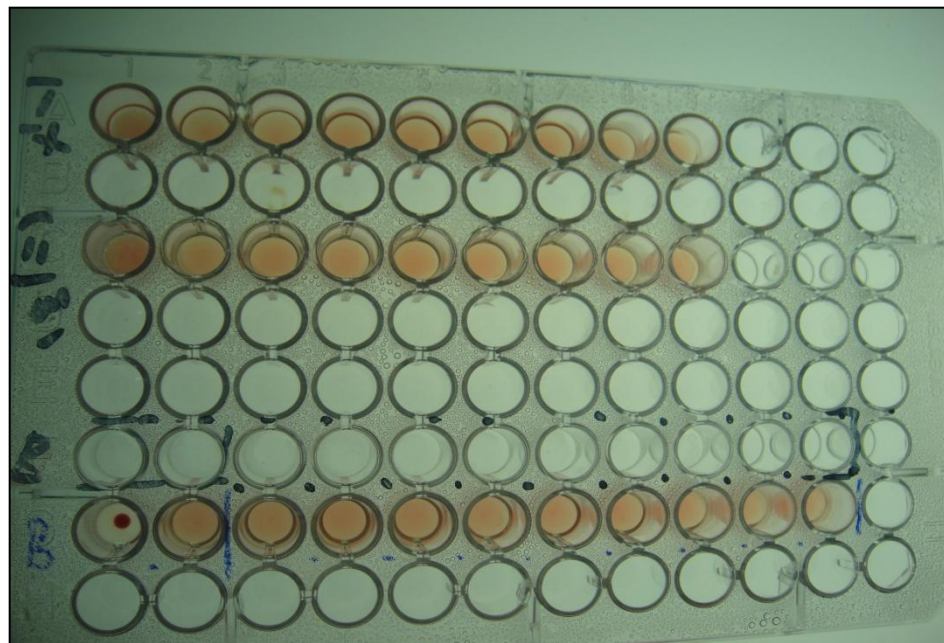
Some difficulty and conclusion:

- Decision making and mass vaccination criticizing

- Compensation fund   for positive animal

- Animal identification and movement control

- Differentiation of vaccine and natural infection

- Finding standard plate/mixer, some reagent for RB and CFT

- No good control on a case of abortion and area-(nomadic, free)

- CFT-125µl is applicable and training, Ring Test needs in national.

- A training course (2-3w) for bacteriology, serology, epidemiology
  and quality management for The National reference lab is needed.

IV. Country plan/policy for regional collaboration on diagnosis and control of *B.melitensis*

- to continue/update on going control measure and the national program for brucellosis in the country

- to interchange information, experience on diagnosis of brucellosis, distribute and consult/provide to herders

- to improve diagnostic capacity for brucellosis national reference lab and protection human health

- to train local vet on the diagnosis quality of brucellosis

- to study validation of serological tests in animals and bacteriology, molecular biology and data analysis

- A special training for the bacteriology, serology and QM

- to supply a standard plate/mixer and reagent of RB/CFT

Thanks much for your attention
Ih bayarlalaa

SCVL