

COMMISSION
OF THE
EUROPEAN COMMUNITIES

SANCO/10339/2005

Directorate General for
Health and Consumer Protection

SANCO/E.2

REPORT ON THE

**TASK FORCE MEETING
OF THE
SHEEP & GOATS
BRUCELLOSIS SUB-GROUP**

Nikosia, Cyprus, 18-19 May 2005

REPORT OF THE
“SHEEP & GOATS BRUCELLOSIS” TASK FORCE SUB-GROUP MEETING
HELD IN NICOSIA (LEFKOSIA), CYPRUS, ON 18-19 MAY 2005

Participants: see Annex 1

Agenda: see Annex 2

DAY 1

The meeting was held in Nicosia (Lefkosia), in the headquarters of the Cypriote Central Veterinary Services.

The presentations and discussions were in English. Copies of all the overheads presented were handed over to the experts and a CD with all presentations was given to the experts at the end of the meeting. The first day of the meeting was dedicated to the sheep and goats brucellosis national eradication programme. The second day included, in the morning, a visit to sheep and goat flocks, to the Veterinary services to look at the database running and to the brucellosis laboratory. At the end a meeting was held with the Cypriote counterpart for clarification of matters and discussion of the sheep and goat brucellosis programme and the list of recommendations.

STRUCTURE AND ORGANIZATION OF VETERINARY SERVICES (*Giorgos NEOPHYTOU*)

At central level, the veterinary services are in the ministry of agriculture, natural resources and environment. The services include the animal health and welfare division, the veterinary public health division, the veterinary medicinal products sector and the veterinary laboratories (see fig.1).

The animal health and welfare division is in charge of:

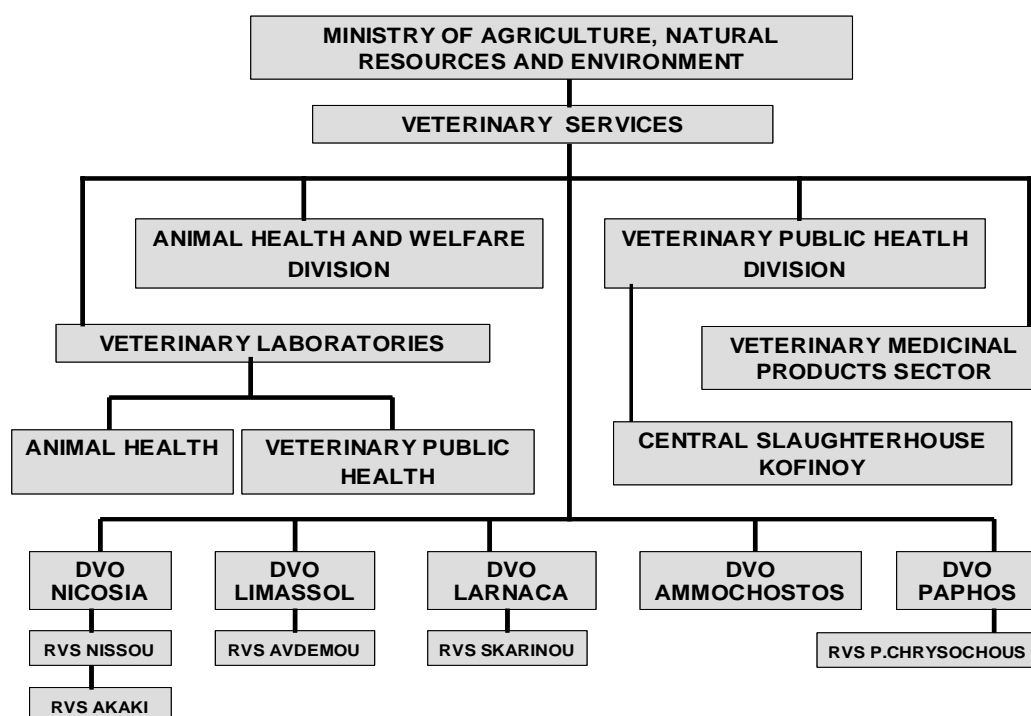
- The eradication and monitoring programmes (mainly Brucellosis, EBL, Tuberculosis, Scrapie, Bluetongue, Salmonellosis, Trichinellosis and several Pig Diseases),
- The contingency plans,
- The database for the identification of bovines, small ruminants, pigs and dogs.
- The administration of the two Border Inspection Posts at Larnaca Airport and Limassol port.

Veterinary laboratories (the Diagnostic and Research Laboratories (*i*) for Animal Diseases and, (*ii*) for Food of Animal Origin) are part of the central veterinary services. One subdivision of the former is in charge of brucellosis diagnosis. Moreover, three satellite laboratories can perform Rose Bengal tests for the surveillance of non-infected flocks. At

regional level, the part of the country under governmental control is divided in five district veterinary offices (DVO). Some of them include one or two rural veterinary stations (RVS). Veterinarians at the regional level implement the identification of farm animals, carry out the eradication programmes, and inspect animal holdings and food producing establishments. They can also provide treatments to farm animals.

The staff of the Veterinary services includes an adequate number of people: 71 Veterinary Officers, 11 Veterinary Pharmacists, 127 Veterinary Inspectors – Veterinary Assistants – Vet Clerks, 29 Accounting and Clerical Staff and 78 Auxiliary Staff.

Fig. 1. Structure of the Cypriote Veterinary Services



STRUCTURE AND DISTRIBUTION OF OVINE AND CAPRINE LIVESTOCK IN CYPRUS (*Polyvios Neocleous*)

300,000 sheep (Chios, Local, Awassi and Cross breeds) and 360,000 goats (Damascus, Local, Macheras local, Damascus X Local, French Alpine and Saanen breeds) are held in about 4,200 farms (160 animals/flock), located on the periphery of the island and in areas where the height is less than 1050 meter above sea level (the centre of the island consists in the Troodos mountain). There are also 62,000 cattle (Holstein-Friesian and Local breeds) in Cyprus.

The particular case of the so-called "farming areas" is to be emphasized. "Farming areas" are places where livestock belonging to farmers coming from the northern (occupied) part of the island has been gathered. In these areas, only fences separate the animals of neighbouring flocks. 46% of flocks (54% of sheep and goats) are held in these farming areas.

However, flocks are always kept separately, without transhumance or common pasture.

Most of the farms are private, belong to a single owner (or family), the ownership changing from father to son. For many farmers animal breeding is the main income source. The average age of the farmers is over 50 and a majority of them attended elementary or secondary school.

REGISTRATION, IDENTIFICATION AND CONTROL OF OVINE AND CAPRINE MOVEMENTS (*Polyvios NEOCLEOUS*)

Animals are individually identified. Identification is carried out before 30 days of age or, if younger, before the animals leave the flock of birth. Animals and flocks are registered in a national database. Flocks status as regard brucellosis is recorded as well. There is a double notification of movements. When selling animals, the owner asks for a “movement document”, that is an authorization, to the veterinary services. All moving animals from an officially free flock are tested for brucellosis. If the flock is not officially free, all animals of the flock have to be tested before the movement. The animals, accompanied by 2 copies of the movement document, are sent to the destination. The new owner notifies the on-movement to the veterinary services. Off-movement and on-movement are recorded in the database and crosschecked.

The Movement-Document contains:

- Information about ear-tag code of the animal, animal kind, driver's full name and ID number, driver's signature, transport vehicle reg. Number
- For both buyer and seller, name and surname, ID number, date, farm code of origin farm, farm code of destination farm, signature and also some Fields for official use

Checks may be carried-out by the database with the following queries:

- Is for the off-movement the relevant on-movement recorded?
- If yes, are all data recorded for each one the same as the data recorded for the other (movement code, date, origin farm, destination farm etc.)?
- Are there any restrictions applied on the farm of origin?
- Is the “current farm” of the animals that moved, the same as the farm of origin/destination of the movement?
- Are on both movement documents the same ear-tag codes registered?

HISTORICAL BACKGROUND, GENERAL PRESENTATION OF THE ERADICATION PROGRAM FOR OVINE AND CAPRINE BRUCELLOSIS IN CYPRUS – ORGANIZATION OF THE CAMPAIGNS – PROCEDURES FOLLOWING CONFIRMATION, PROCEDURES CONCERNING COMPENSATION (*Ioannis IOANNOU*)

Historical background

After sporadic outbreaks until 1973, a National Eradication Programme was successfully implemented during the period 1973-1985, based on test and slaughter policy. Until 1997, no outbreaks were detected except a single outbreak in 1993 due to illegal movements from the

occupied area of the island. In 1997-2000 the disease did reappear and a new National Eradication Programme is running since year 2001. The coverage rate of the programme has been 100% of the holdings since year 2002.

Main elements of the campaigns

The main actions carried out in the frame of the campaigns are as follows:

- Registration, identification and movement restrictions: individual identification of animals since year 2002, ban of animal markets, pre-movement tests;
- Computerised database recording all parameters of the campaign;
- Animal movements for breeding purposes are permitted only after a negative serological examination;
- Sero-surveillance, based on RBT and CFT, is carried out on sheep and goats over six months old. Abortions should be compulsorily notified;
- Confirmation of outbreaks based on laboratory information (serology, bacteriology), epidemiological inquiries (performed according to the task Force guidelines) and history of the flock;
- In breakdowns, a disinfection is carried out monthly;
- Prompt removal of positive animals (average 1 week), and intensive re-testing of the flock (monthly) until a negative result is achieved. Then the qualification protocol starts, based on four checks with negative results in a six-month period;
- Positive animals are removed by an official/contracted service and slaughtering is centralised in a single abattoir;
- The compensation rate, based on official tables, can be considered excessive, according with some comments of the Veterinary Service;
- Actions are implemented by the official staff, nevertheless for some tasks is re-enforced by temporary personnel.

Procedures following confirmation

The decision-making chart of the campaign is based on a Brucellosis Committee. That Committee, made by 3 Veterinary Officers, takes position, case by case, on (i) declaration of outbreaks, (ii) depopulation of flocks and, (iii) qualification/re-qualification of holdings.

The Committee uses all the relevant available information: laboratory results, epidemiology, and history of the flock/breeder. Nevertheless, the internal procedures and the criteria applied are not fully standardised.

EPIDEMIOLOGICAL EVOLUTION - QUALIFICATIONS OF HERDS (REQUIREMENTS AND RESULTS) (Giola MPARGOULI)

The causative agent of brucellosis of both sheep/goats and bovine in Cyprus is *Brucella melitensis*. *B. abortus* has only been diagnosed in Cyprus in the period 1921–1932, when it

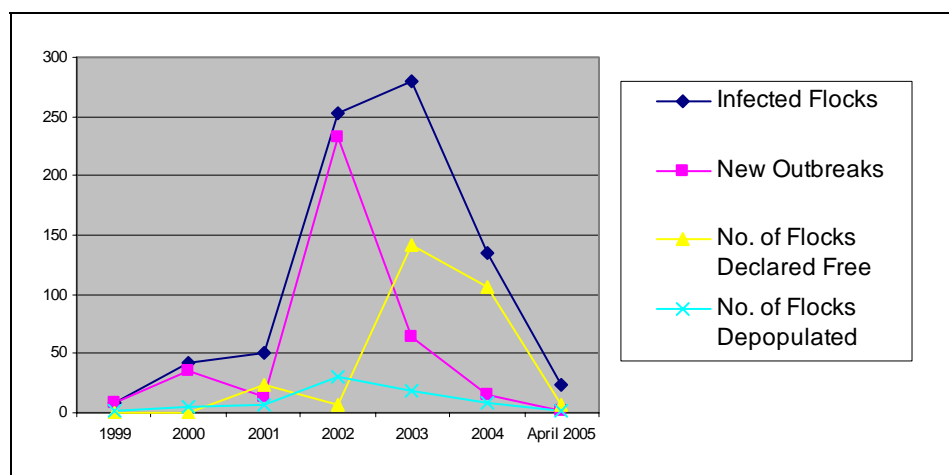
was introduced by cattle imported from UK. Table 1 shows the progress of the Brucellosis Eradication Programme (BREP) programme over time, at flock level. The numbers of flocks tested increased in 2002 to 100% coverage in relation to the flocks under the programme. These are around 97% of the total number of flocks in Cyprus.

Table 1. Sheep and goats flocks tested

Year	Flocks in BREP	Flocks tested	New outbreaks	Total infected flocks	Flocks declared free	Flocks depopulated	Positive flocks by December
1997	5,115	902	4	4	0	4	0
1998	4,256	667	8	8	0	8	0
1999	4,256	1,100	8	8	0	2	6
2000	4,256	2,960	36	42	0	5	37
2001	4,319	996	13	50	24	6	20
2002	4,438	4,438	232	252	6	31	215
2003	4,007	4,007	64	279	141	19	119
2004	4,059	4,059	16	135	106	9	20
4/2005	4,161	747	2	22	6	0	(16)

The evolution of the number of infected flocks and new outbreaks is presented in figure 2, showing the 2002 outbreak. The rapid increase in numbers was also due to the use of a different (less specific) diagnostic technique (the modified Rose Bengal), which led to an increase of false positive results.

Fig. 2. Prevalence and incidence of infected sheep and goats flocks in Cyprus



Since the reappearance of sheep and goats brucellosis in 1997, there were 383 outbreaks, 283 flocks declared free and 84 flocks depopulated. Today 16 positive flocks are under a monthly testing regime. Figure 3 shows the prevalence (N° positive flocks / N° flocks tested) and incidence (N° new positive flocks / N° flocks tested) of sheep and goats brucellosis in the last 7 years. The data presented in figures 2 and 3 show the positive progress of the epidemiological situation of brucellosis in sheep and goats, due to the application of the programme. Further details on the geographical distribution of outbreaks are presented in Figure 4. Data on animals tested, found positive and slaughtered are presented in Table 2.

Fig. 3. Evolution of prevalence and incidence rates of sheep and goats brucellosis in Cyprus

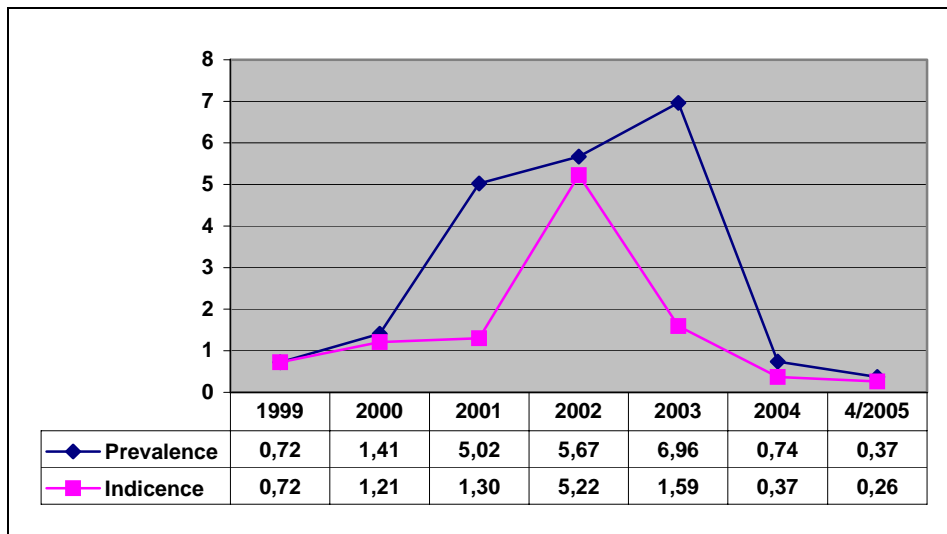


Fig. 4. Distribution of infected flocks in Cyprus

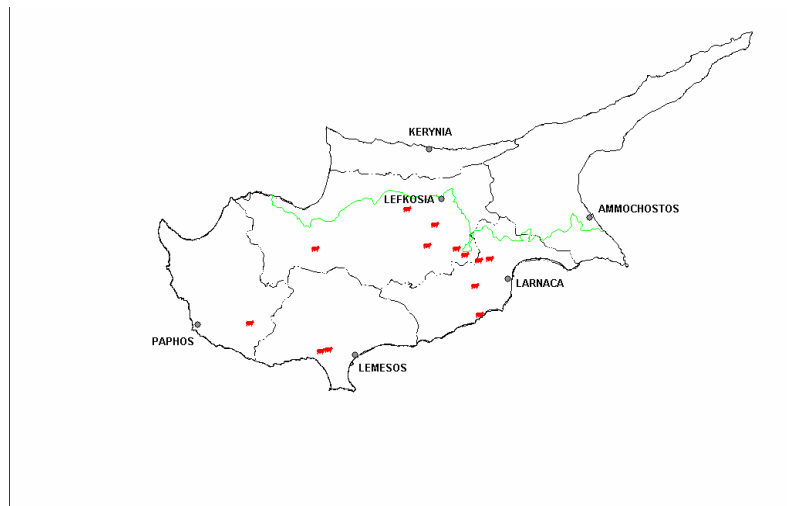


Table 2. Data on tested sheep and goats

Year	Total No. of animals	Animals under the programme	Animals tested	Positive animals	Animals confiscated
1999	623,000	-	31,745	195	-
2000	623,000	-	126,595	895	-
2001	637,000	-	85,693	1,153	-
2002	640,000	-	334,085	3,006	9,929
2003	476,650	453,052	1,022,467	1,385	6,061
2004	552,601	506,428	506,428	212	3,329
4/2005	666,476	564,378	89,262	188	785

84.7% of sheep and goats population is under the programme and in 2004, 100% of coverage was reached. All positive animals were slaughtered as well as co-habitants in some cases.

The history of some infected flocks (example in Figure 5), obtained from the database used for the BREP, were presented and discussed with regard to the decision process of the "Brucellosis Team". This group, which includes the District Veterinary Officers, uses the

available laboratory, historical and epidemiological data to rule out false positive reactions from disease outbreaks (see point on the epidemiological analysis of outbreaks).

Fig. 5 - Examples of infected flocks histories

ΙΣΤΟΡΙΚΟ ΕΞΕΤΑΣΕΩΝ ΕΚΜΕΤΑΛΛΕΥΣΗΣ ΓΙΑ ΒΡΟΥΚΕΛΛΩΣΗ								
CYS5210051 ΧΑΡΑΛΑΜΠΟΥΣ ΒΙΚΤΩΡΑΣ							ΚΟΛΟΣΣΙ	
Ημερομηνίες			Αριθμός Ζώων					
Διεγνητολόγος	Παραλαβή	Αποτέλεσμα	Εξεταζόμενων	Αντιδρώντων	Υάπτων	Θετικών	Αποτέλεσμα εξέτασης	% Θετικών ζώων
	21/01/2003		61	0	0	0	Negative	0
	08/05/2003		655	0	0	0	Negative	0
02/06/2004	08/06/2004	14/06/2004	588	0	0	2	2	0,340
20/08/2004	26/08/2004	06/09/2004	553	1	0	1	2	0,181
10/11/2004	15/11/2004	17/11/2004	175	0	0	0	Negative	0
30/12/2004	03/01/2005	05/01/2005	172	0	0	0	Negative	0

Following the presentation on the sheep and goats brucellosis, a brief description of the situation of bovine brucellosis was presented. Due to the geographical distribution, it seems that the bovine brucellosis outbreaks are related to those of small ruminants. In Cyprus although small ruminants are not in mixed herds with bovines, there are a close proximity of the animals in farms presenting all the species, like one of the farms visited by the group.

Table 3. Bovine population and coverage of BREP

District	Herds n°	Herds in BREP	%	Bovines n°	Bovines in BREP	%
Lefkosia	117	112	95.7	21,029	14,319	68.1
Larnaca	110	100	90.9	26,577	17,784	66.9
Ammochostos	53	49	92.5	9,733	6,410	65.9
Lemesos	33	32	97.0	3,671	2,390	65.1
Paphos	60	59	98.3	1,067	759	71.1
Total	373	352	94.4	62,077	41,662	67.1

The BREP in Bovines involves 94.4% of herds and 67.1% of animals (animals over 12 months old; excluding fattening animals). Data on the evolution of the programme is presented in Table 4.

Table 4. Cattle herds tested

Year	Herds in BREP	Herds tested	New outbreaks	Total infected herds	Herds declared free	Herds depopulated	Positive herds by december
1998	309	29	1	1	1	0	0
1999	318	11	1	1	0	1	0
2000	318	42	2	2	1	0	1
2001	344	308	11	12	3	1	8
2002	317	317	11	19	2	0	17
2003	317	317	8	25	14	1	10
2004	345	345	4	14	8	0	6
4/2005	352	285	2	8	2	0	(6)

The figure 6, showing the trends of infected bovine herds present a similar view as figure 1, related to small ruminants. There is a parallel progression and in all outbreaks. *B. melitensis* was isolated and contact with infected flocks registered (Fig. 7). Since the reappearance of bovine brucellosis in 1998, there were 40 outbreaks, 31 herds declared free and 3 herds depopulated. Today 6 positive herds are under a monthly testing regime.

Fig. 6. Prevalence and incidence of infected bovine herds in Cyprus

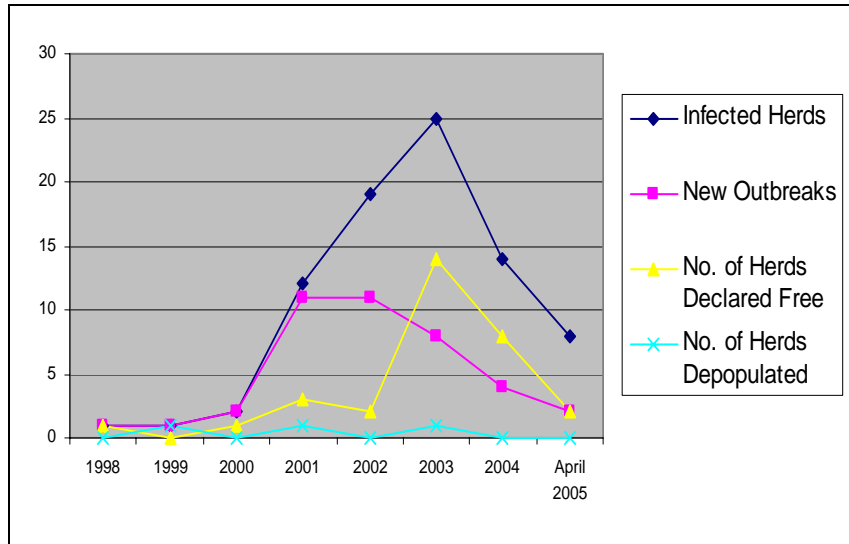
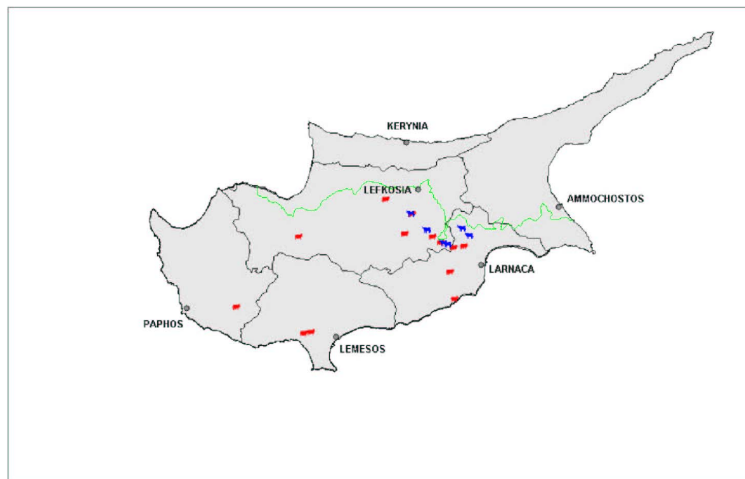


Fig. 7. Distribution of Bovine and small ruminants brucellosis outbreaks in Cyprus 2005



Epidemiological enquiries

In order to ensure that a proper epidemiological investigation is carried out, an epidemiological questionnaire (based on the guidelines recommended by the Task Force) is filled in all cases of new outbreaks and in every suspected case. The questionnaire is analysed to identify sources and trends in infection and to allow the appropriate targeting of disease

control strategies and a more effective coordinated disease control strategy. Several examples were shown. Based on the evaluation of questionnaires results the most common reasons for a new outbreak are (i) neighbouring with known infected flocks (most common), (ii) common use of machines and equipment, (iii) illegal movements of animals from known infected flocks, (iv) sharing of pasture and, (v) mechanical vectors (e.g. lorries of traders).

In conclusion, the epidemiological data indicates a low level of flock infection and a good progress of the Brucellosis Eradication Programme in Cyprus.

CENTRAL DATABASE FOR EPIDEMIOLOGICAL RESULTS - PRESENTATION OF THE DATABASE FOR LABORATORY RESULTS (*Giola MPARGOULI*)

A database is used by veterinary services in order to record the results of brucellosis serological examinations. In this database, the results are recorded at flock level, not at animal level. The database is centrally located, at the Animal Health and Welfare Division. The laboratories do not have a direct access to the data; nevertheless they can have an indirect access, either through telephone communication or going to the DVO to collect the data.

The database is linked to the tables of the database of the National Animal Identification and Registration Scheme (IRSC). All the tables of Brucellosis database have an access background in order to be able to extract required information using queries.

The detailed data on specific farms (*i.e.*, sampling date, test performed, number of tested animals, number of positive animals) can be retrieved either by using the name of the farmer or by using the farm code number. The software can also produce reports on the testing history of the selected farm or a testing history of infected farms. The software can produce other kinds of reports, *i.e.* the list of the officially free farms, the list of the officially free farms to be re-tested within two months. Through this software the veterinary services can issue the declaration of farm as “Officially brucellosis-Free”.

A new on-line database, based on Oracle technology, is being tested by CVO. In this database, the personnel of the laboratories can directly record the results of laboratory testing. The software, more sophisticated, records the results also at animal level and is connected with the database for animal’s identification and registration. The on-line system will make possible the creation of a chain where the results of tests performed by different laboratories and for different diseases shall be retrieved, downloaded and evaluated by all the personnel involved.

ORGANIZATION OF CYPRUS BRUCELLOSIS LABORATORY OF REFERENCE-DIAGNOSTIC TESTS AND RESULTS (*Maria LIAPI*)

In Cyprus there are 4 state veterinary laboratories dealing with diagnosis of *Brucella spp.* infection. The brucellosis National Reference Laboratory (NRL) is sited in Lefkosia and its

responsibilities are the testing of antigens used for serological diagnosis of brucellosis, the distribution of antigens to district laboratories as well as their coordination. In this laboratory are serving one veterinarian and four technicians. The NRL has been renovated recently and from the visit made by the group it appears well equipped in order to cover all the needs of the brucellosis eradication program.

In Cyprus there are 3 "satellite" laboratories in the districts of Larnaca, Limasol and Paphos. In each district laboratory is serving a veterinarian and a technician. The district laboratories perform only the routine testing of sera by the RBT for the corresponding area. The NRL serves as the district laboratory for the Lefkosia district. The NRL is also responsible for testing (in CFT) the sera originated from the district laboratories that gave positive results in the screening test (RBT). The tests are performed and the reagents are calibrated according to the requirements of EU regulations. In case that in a batch of sera more than 5% of the samples are positive to RBT, all the samples are sent if needed to the NRL that tests them with the CFT. The number of sera tested in each laboratory is presented in the following table.

Laboratory	2003	2004	2005 (04)
Nicosia	333,437	162,782	38,965
Larnaca	247,269	181,500	68,846
Limasol	107,942	124,525	25,842
Paphos	178,216	71,792	36,062
TOTAL	868,867	540,599	171,720

The abortions reported as well as samples of infected sheep and goats are cultured in the NRL. The cultures performed during 2004 are presented with results in the following table.

	Total	Negative	Positive
Milk	56	34	22
Fetus	128	128	0

DAY 2

VISIT TO A SHEEP AND GOAT FARM

The subgroup visited a goat farm in a "farming area" to better understand the breeding conditions in this singular farming system. It was a medium size farm (around 150 animals, mainly goats and some sheep of local and crossed breeds). The farm was an example of a moderate mechanised dairy goat farm. The farm was located in a "farming area" composed by 15-20 farms. Total surface of this farming area was *ca.*10 Ha. Individual farms are very closed one from the other and the only separation between neighbour farms is a narrow road or path. The sanitary management of the farming area as a single epidemiological unit was

described and the difficulties posed by this kind of farms were extensively discussed as well as the appropriate strategies to deal with brucellosis under these local conditions. Measures in place have demonstrated to be effective for the control and eradication of brucellosis.

CONCLUSIONS

The S&G brucellosis subgroup of the task force for monitoring animal diseases acknowledges the excellent progress of the programme in Cyprus that should continue with the same focus and energy up to eradication of the disease. Among the activities developed it is considered of special relevance:

- i. The development of animal identification and databases allowing population control and programme control both at operational and epidemiological levels; The good understanding of each outbreak through the collection and analysis by a specific committee of laboratory, historical and epidemiological data;
- iii. The laboratory support to the decision making using standardised techniques;
- iv. The rapid removal of infected animals from premises after a positive result;
- v. The good level of organization and communication between entities running the programme;
- vi. The good level of involvement and cooperation of farmers;

RECOMMENDATIONS OF THE BRUCELLOSIS SUBGROUP

In order to help the Cypriot Veterinary Services to achieve more rapidly the eradication, the group would recommend: Closer a programme is from eradication more specific outbreak diagnosis is required. Therefore a protocol to investigate false-positive serological reactions and helping in decision-making should be established.

- ii. The existing committee is working in this issue of confirming outbreaks and clarifying false-positive serological reactions but its experience should be documented. Bacteriology should be used more systematically to further clarify possible outbreaks. In infected flocks, the use of RBT and CFT in parallel would increase the sensitivity of diagnosis helping the efficiency of outbreak eradication
- v. Rate of stamping-out should increase progressively to be performed in cases in which the method is feasible
- vi. The amount paid as compensation should be reconsidered in order to be used as a tool "discouraging" the presence/acquisition of brucellosis in a flock
- vii. The maintenance of a strong surveillance system to brucellosis, including the continue dialog with farmers, is important to prevent the re-introduction of disease in order to achieve the best level of bio-security in farms

PARTICIPANTS**OF THE “SHEEP & GOATS BRUCELLOSIS” TASK FORCE SUBGROUP MEETING HELD IN NICOSIA (LEFKOSIA), CYPRUS, ON 18-19 MAY 2005**

- **Task Force Sub-Group**

Dr. Bruno GARIN-BASTUJI	Chairman
Dr. Thierry BADIN DE MONTJOYE	France
Dr. Fabrizio DEMASSIS	Italy
Dr. Manuel DURÁN FERRER	Spain
Dr. Anastasios MINAS	Greece
Pr. Dr. Yolanda VAZ	Portugal
Dr. Fernando CRESPO-LEON	Spain (private expert)
Dr. Francisco REVIRIEGO-GORDEJO	Commission
Dr. Jean-Pierre VERMEERSCH	Commission

- **Cypriote Representatives**

Animal Health and Welfare Division

Dr. Giorgos NEOPHYTOU	Principal Vet. Officer	Head
Dr. Polyvios NEOCLEOUS	Vet. Officer	
Dr. Giola MPARGOULI	Vet. Officer	
Ms Elena ORPHANOU	Assistant Clerical Officer	

Central Veterinary Laboratories

Mr. Michael PAPAPRODROMOU	Senior V. Officer	Officer in charge
Mr. Ioannis IOANNOU	Vet. Officer	Pathology, Bacteriology, Parasitology
Ms Maria LIAPI	Vet. Officer	Serology, Bacteriology
Ms Maria AVRAAM	Vet. Inspector	Serology, Bacteriology

Veterinary Public Health Division

Dr. Charalambos KAKOYIANNIS	Senior Vet. Officer	Head
Dr. George KYRIAKIDES	Vet. Officer	Coord. Dairy Products Inspection
Ms Efi KOUDOUNA	Vet. Officer	Training Liaison Officer

District Veterinary Offices

Mr. Charalambos THEODOROU	Senior Vet. Officer	Famagusta DVO
Ms Paraskevi MPLETSA	Vet. Officer	Famagusta DVO
Mr. Ramon PAPADOPOULOS	Vet. Officer	Paphos DVO
Mr. Christakis PLOUTARCHOU	Vet. Officer	Limassol DVO
Mr. Philippos HADJIPHILIPPOU	Vet. Officer	Avdemou Rural Vet. Station
Ms Elena GEORGIU	Vet. Officer	Larnaca DVO
Ms Giola IAKOVOU	Vet. Officer	Nicosia DVO

AGENDA

**OF THE “SHEEP & GOATS BRUCELLOSIS” TASK FORCE SUBGROUP MEETING HELD
IN NICOSIA (LEFKOSIA), CYPRUS, ON 18-19 MAY 2005**

FIRST DAY

- 09.00-09.15 Welcome and introduction
- 09.15-09.30 Greeting by the President of the task force subgroup
- 09.30-09.45 Structure and organization of Veterinary Services
- 09.30-09.50 Structure and distribution of ovine and caprine livestock in Cyprus-
- 09.50-10.10 Registration, identification and control of ovine and caprine
movements
- 10.10-10.30 Coffee break*
- 10.30-11.00 Historical background, general presentation of the eradication program
for ovine and caprine brucellosis in Cyprus
- 11.00-11.45 Organization of the campaigns – Procedures following confirmation,
procedures concerning compensation
- 11.45-12.15 Qualifications of herds (requirements and results)
- 12.15-13.00 Discussion
- 13.00-14.30 Lunch*
- 14.30-15.15 Central database for epidemiological results - Presentation of the
database for laboratory results
- 15.15-16.00 Organization of Cyprus brucellosis laboratory of reference-Diagnostic
tests and results
- 16.00-16.30 Coffee break*
- 16.30-18.30 Discussion

SECOND DAY

- 08.30-10.30 Visit to sheep and goat farms
- 10.30-11.00 Visit to the brucellosis laboratory and the central veterinary services
- 11.00-11.15 Coffee break*
- 11.15-13.15 General discussion; Recommendations and closing meeting