

## ANNUAL REPORT: 2002

### National Service for Udder Health and Milk Quality.



Presented to the Professional Committee and the Directorate of the  
Service.

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## **FOREWORD.**

The aim of the National Service is to improve udder health and milk quality of all milk producers in Israel. Its activities center mainly on bacteriological testing: checking standards set for milking parlors and milking equipment; examining management and milking management procedures; guidance, advice and information for all those involved in milk production.



## **SUMMARY**

### **A: MILK QUALITY.**

Somatic Cell Counts (SCC);

Total Bacteria counts,

Milk disorders, acidity, taste, smell, blood, etc.

### **B: INSTRUCTORS ACTIVITY – 2002**

### **C: MASTITIS**

Clinical

Sub- clinical, and other;

Sensitivity test to microbiological materials.

### **D: LABORATORY REPORTS**

### **E: PROFESSIONAL GOALS.**



## **Milk Quality (SCC)**

This year the trend of improvement in the level of SCC continued in all categories (Table 1), relating to all milk produced and marketed. (Tables 1,2,3). The main improvement showed in the Moshav sector, advancing to grade A and “Excellent”. However, 10% of moshav producers and 1.4% of the Kibbutz sector still marketed milk which contains over 400.000 SCC. This reveals the production of sub-standard milk as the result of sub clinical mastitis - causing damage to the udder (table 4). The closure of some 100 Moshav producers in 2002 has led to a general improvement in the quality of milk marketed in Israel.



## Milk Quality: Somatic Cell Count (SCC)

**Table No. 1: SCC averages by sectors 1999 – 2002**

Year	1999	2000	2001	2002
<b>Average SCC Kibbutz Herds x 1000</b>	301	259	262	252
<b>Average SCC Moshav Herds x 1000</b>	451	397	340	279
<b>Average SCC x 1000</b>	351	304	286	262

**Table No. 2: % milk marketed by grade – Kibbutz Herds**

Grade	1999	2000	2001	2002
<b>100,000&gt;</b>	0	0	0	0
<b>101,000 – 200,000</b>	4.4	14.1	8.1	9.9
<b>201,000 – 400,000</b>	86.8	82.7	90.2	88.7
<b>401,000 – 650,000</b>	8.8	3.2	1.6	1.4

**Table No. 3: % milk marketed by grade – Moshav Herds**

Grade	1999	2000	2001	2002
<b>100,000&gt;</b>	0	0	0.13	1.1
<b>101,000 – 200,000</b>	3.6	11.2	14.9	21.2
<b>201,000 – 400,000</b>	41.5	48.2	60.1	67.5
<b>401,000 – 650,000</b>	42.0	31.0	20.9	10.5

**Table No. 4: Herd Udder Health Indicator by SCC level**

<b>Below 100,000</b>	<b>Healthy Herd</b>
<b>101,000 – 200,000</b>	<b>Slightly Infected</b>
<b>201,000 – 400,000</b>	<b>Medium Infected (40% – 50%)</b>
<b>401,000 – 650,000</b>	<b>Highly Infected (50% -- 60%)</b>
<b>Above 650,000</b>	<b>Very Highly Infected (more than 60%)</b>

Table number 5 shows milk grading by SCC according to milk standards for 2002. When graded by months of the year we find that most of the high quality milk (Premium and Grade A) was produced in the winter months (September - March). The reason for this being the ability of producers to regulate the culling of “high SCC cows” as the result of increased production in the cooler months.

**Table No. 5: Milk grading by SCC – 2002**

Grade	Monthly Average	Price
Premium	Below 250,000	101.5 %
A	250,000 – 350,000	100 %
B	350,000 – 450,000	98 %
C	450,000 – 650,000	95 %
D	Above 650,000	94 %

## Milk Quality – Total bacteria Count

2002 saw no improvement in the quality of the total bacteria count of milk marketed. In the premium grade (below 30,000 bacteria/ml) there was no improvement from the previous year. Premium and A grade accounted for 98.5% of all milk marketed. There was no significant difference during different seasons of the year. We should not rest on our laurels and strive to change the standards to those in Europe and other parts of the world especially of the Premium and Grade A milk.

### Total Bacteria count

Year	Premium	A	B	C
2000	66.6	30.1	2	1.3
2001	73.6	25.3	0.7	0.4
2002	73.7	24.8	0.6	0.9



### **Milk Quality – Abnormal Milk**

According to information received from the processing plants, 1,500,000 liters of milk was discarded in 2002 (2001 – 1,700,000 liters). This accounted for 21% of all abnormal milk received at the gate of the plants. Milk was discarded when unfit for human consumption. In comparison to the previous year there was a reduction in the amount of milk discarded because of “inhibitors”. Regardless of last years results there is still place for improvement.

Table No. 6: Summary of causes for Abnormal Milk (in liters) 2002

<b>Abnormal Milk</b>	<b>Received for Processing</b>	<b>Certified for use</b>	<b>Discarded/ Destroyed</b>	<b>% Discarded</b>
<b>Taste</b>	247,328	9,940	237,388	96
<b>Visual</b>	110,558	3,343	107,215	97
<b>Smell</b>	225,932	9,732	216,200	96
<b>Temperature</b>	1,202,762	1,191,386	11,376	0.9
<b>Acidity (SH)</b>	2,165,717	1,892,566	273,151	13
<b>Inhibitors</b>	711,256	294,602	416,654	58
<b>Water</b>	2,644,955	2,378,322	266,633	10
<b>Total</b>	<b>7,308,508</b>	<b>5,779,891</b>	<b>1,528,617</b>	<b>21</b>



## Milking management advisers

### Reasons for visits by milking management advisers

<b>Reason for Visit</b>	<b>Number of Visits</b>	<b>% Of Visits</b>
<b>Routine Visit</b>	762	42
<b>Milk Quality</b>	229	13
<b>High SCC</b>	405	22
<b>Consultation</b>	202	11
<b>Follow up</b>	210	12
<b>TOTAL</b>	1808	100

### Type of activity during visit by milking management adviser

<b>Type of Activity</b>	<b>Amount</b>	<b>% Of Activity</b>
<b>Technical Check Up</b>	1221	57
<b>Dynamic Check</b>	60	3
<b>Hygiene &amp; Cleaning</b>	346	16
<b>Milking Procedures</b>	330	15
<b>Milk sampling</b>	125	6
<b>Symposiums</b>	65	3

## **Mastitis – Clinical Mastitis**

During 2002 11,286 samples were cultured from cows with clinical mastitis. The results are in table no. 7. This year there was a reduction in the amount of Strep. Agalactiae cultured and almost a complete disappearance of the contagious/environmental Nocardia. At the same time we see an increase in E. Coli infections from 28% to 31% of all clinical infections. We must commend the improvement in milk sampling technique by the producers; this can be seen in the significant reduction of contaminated samples in the past two years.



Table No. 7:

**Clinical Mastitis cultures by pathogen type, 2000 – 2002 (%)**

<b>Pathogen</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>Strep. Agalactiae</b>	<b>0.08</b>	<b>0.04</b>	<b>0.02</b>
<b>Strep. Dysgalactia</b>	<b>5.8</b>	<b>6.1</b>	<b>7</b>
<b>Strep. Uberis</b>	<b>1.5</b>	<b>2.1</b>	<b>1.6</b>
<b>Other Streptococci</b>	<b>5.1</b>	<b>4.9</b>	<b>4.4</b>
<b>Staph. Aureus</b>	<b>2.4</b>	<b>1.8</b>	<b>2.1</b>
<b>CNS</b>	<b>7.8</b>	<b>7.5</b>	<b>8.4</b>
<b>Corynebacterium Bovis</b>	<b>2.4</b>	<b>2.2</b>	<b>2</b>
<b>Escherichia Coli</b>	<b>23.5</b>	<b>28</b>	<b>31</b>
<b>Actinomyces Pyogenes</b>	<b>1.7</b>	<b>2.4</b>	<b>2.5</b>
<b>Nocardia sp.</b>	<b>1.48</b>	<b>0.3</b>	<b>0.1</b>
<b>Bacillus sp.</b>	<b>0.3</b>	<b>0.3</b>	<b>0.2</b>
<b>No Growth</b>	<b>25.8</b>	<b>26.3</b>	<b>24</b>
<b>Contaminated</b>	<b>14.8</b>	<b>9.3</b>	<b>8.6</b>
<b>No Pathogens</b>	<b>4.9</b>	<b>5.8</b>	<b>4.8</b>
<b>Other</b>	<b>2.44</b>	<b>2.96</b>	<b>3.28</b>

## **Mastitis – Sub clinical and other**

72,899 selective samples were cultured during 2002 from routine screening of quarters (only cows with SCC above 200,000 in the last DHI check were sampled). The results can be seen in Table no. 8.

In comparison to last year we found no significant changes in sub clinical infections. “No Growth” accounted for more than 40% of the cows.

Table no. 9 shows the results of 31,519 samples sent by producers that are not from clinical mastitis: cows before “drying off“, cows after calving, high SCC, etc.



**Table No. 8:**

Sub Clinical Mastitis cultures by Pathogen types 2000 – 2002 (%)

<b>Pathogen</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>Strep. Agalactiae</b>	<b>0.04</b>	<b>0.01</b>	<b>0.08</b>
<b>Strep. Dysgalactia</b>	<b>3.1</b>	<b>2.6</b>	<b>2.6</b>
<b>Strep. Uberis</b>	<b>1.25</b>	<b>1</b>	<b>1</b>
<b>Other Streptococci</b>	<b>3.7</b>	<b>3.3</b>	<b>3</b>
<b>Staph. Aureus</b>	<b>3.1</b>	<b>3.3</b>	<b>1.4</b>
<b>CNS</b>	<b>17</b>	<b>18.2</b>	<b>20</b>
<b>Corynebacterium Bovis</b>	<b>12.6</b>	<b>12.5</b>	<b>12.8</b>
<b>Escherichia Coli</b>	<b>2.1</b>	<b>2.1</b>	<b>2.2</b>
<b>Actinomyces Pyogenes</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>
<b>Nocardia sp.</b>	<b>0.5</b>	<b>0.09</b>	<b>0.03</b>
<b>Bacillus sp.</b>	<b>1.7</b>	<b>1.8</b>	<b>1.75</b>
<b>No Growth</b>	<b>40.3</b>	<b>41</b>	<b>40.6</b>
<b>Contaminated</b>	<b>5</b>	<b>3.5</b>	<b>3.5</b>
<b>No Pathogens</b>	<b>6.3</b>	<b>7</b>	<b>8.2</b>
<b>Other</b>	<b>3.11</b>	<b>3.3</b>	<b>2.54</b>

**Table No. 9:**

“Other” Mastitis cultures by Pathogen types 2000 – 2002 (%)

<b>Pathogen</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>Strep. Agalactiae</b>	<b>0.1</b>	<b>0.1</b>	<b>0.01</b>
<b>Strep. Dysgalactia</b>	<b>2.3</b>	<b>2.2</b>	<b>2.9</b>
<b>Strep. Uberis</b>	<b>0.9</b>	<b>0.8</b>	<b>1.2</b>
<b>Other Streptococci</b>	<b>4</b>	<b>3.1</b>	<b>3.1</b>
<b>Staph. Aureus</b>	<b>2.7</b>	<b>2.6</b>	<b>1.7</b>
<b>CNS</b>	<b>14.4</b>	<b>16.5</b>	<b>16.1</b>
<b>Corynebacterium Bovis</b>	<b>3.6</b>	<b>3.4</b>	<b>5.6</b>
<b>Escherichia Coli</b>	<b>4.1</b>	<b>3.5</b>	<b>4.2</b>
<b>Actinomyces Pyogenes</b>	<b>0.3</b>	<b>0.4</b>	<b>0.3</b>
<b>Nocardia sp.</b>	<b>0.9</b>	<b>0.1</b>	<b>0.04</b>
<b>Bacillus sp.</b>	<b>0.6</b>	<b>0.8</b>	<b>1.5</b>
<b>No Growth</b>	<b>29.8</b>	<b>33</b>	<b>31.3</b>
<b>Contaminated</b>	<b>14.7</b>	<b>10.3</b>	<b>10.3</b>
<b>No Pathogens</b>	<b>6.5</b>	<b>8.2</b>	<b>8.3</b>
<b>Other</b>	<b>15.1</b>	<b>15</b>	<b>13.45</b>

## **Mastitis – Anti-biograms**

3616 anti-biograms were done during 2002. Table no 10 shows the number of tests by different pathogens. The test was done on Mueller Hinton Agar, with the result being the size of the area affected by the antibiotic being checked.

**Table No. 10: Number of antibacterial sensitivity tests by bacteria diagnosed in the udder during 2002**

<b>Bacteria</b>	<b>No of Tests</b>
<b>Escherichia Coli</b>	1944
<b>Staph. Aureus</b>	615
<b>Strep. Dysgalactia</b>	606
<b>Strep. Uberis</b>	78
<b>Other Streptococci</b>	235
<b>Strep. Group G</b>	7
<b>CNS</b>	131
<b>Total</b>	3616

Table no. 11 shows the results of anti-biograms done on Penicillin G against Staph. Aureus during the years 1999 – 2002.

Results show very little or no change in the resistance of the bacteria against Penicillin G. This encouraging result is probably due to the calculated use by veterinarians and producers of antibiotics. Similar tests

in Denmark show a resistance by Staph. Aureus of 20% against Penicillin G, this should be our goal as well.

**Table No. 11: Resistance of Staph. Aureus to Penicillin G 1999 – 2002**

<b>Year</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>No. of Tests</b>	<b>894</b>	<b>715</b>	<b>717</b>	<b>615</b>
<b>% resistance to Pen. G</b>	<b>49</b>	<b>48</b>	<b>45</b>	<b>48</b>

Other bacteria tested showed no significant changes over the years.

When Staph. Aureus was checked for sensitivity against other antibiotics we found an increase in the sensitivity compared to previous years against the antibiotics tested .

2326 sensitivity tests were conducted on Staph Aureus during the last three years against the following antibiotics:

Penicillin G, Amoxicilin , Nafcilin , Ceftazidim, Erythromycin, STX.

One must take into account that the results were obtained in the laboratory (in vitro) and positive results are not always the same in practice (in vivo).





## Laboratory Reports

There was an increase in the number of tests carried out by the laboratories during 2002. The main increase being in the amount of routine and “other” samples checked (table no 12). We must take into account that nearly 100 Moshav herds were closed. There was an increase, in routine checks (done by our field technicians) and nearly double the amount of small ruminants. Throughout the year, there was a steady flow of bulk tank samples sent by the processing plants for checks against Strep.

Agalactiae. Continuing advice by the staff of the National service for udder health and milk quality, and the help of the processing plants led to an improvement in this field.

There is a fee charged for progesterone checks in milk done by the laboratories and the increase over last year is mainly because of research.

The clinical veterinarian is needed to explain the importance of this check to the producers.

Today we are the main laboratory in the country conducting progesterone tests in milk and we must strive to continue being so in the future.



Table no 12 shows the amount of samples handled by the laboratories during 2002

**Table No. 12: Comparison of amount of cultures 1999 – 2002**

Type of Culture	1999	2000	2001	2002
<b>Routine</b>	<b>97478</b>	<b>84290</b>	<b>88601</b>	<b>96522</b>
<b>Sampled by Producer</b>	<b>31443</b>	<b>53458</b>	<b>48864</b>	<b>46897</b>
<b>Bulk Tank</b>	<b>2770</b>	<b>2264</b>	<b>1901</b>	<b>2028</b>
<b>Small Ruminants</b>	<b>1310</b>	<b>1304</b>	<b>3195</b>	<b>6804</b>
<b>Progesterone</b>	<b>2651</b>	<b>1795</b>	<b>905</b>	<b>1167</b>
<b>Total</b>	<b>135,652</b>	<b>143,111</b>	<b>141,446</b>	<b>153,418</b>

- Sampled by Producer: - mainly clinical samples and “other samples” (before drying off, after calving, high SCC, research, etc.



## **Professional goals and achievements in 2001 – 2002**

A short summary of goals and achievements that we tried to attain during 2002.

(Presented in the 2001 summary)

1. Reduction of the national SCC level to below 300,00, with a major effort in the moshav sector, with cooperative producers, who are willing to implement our professional recommendations. – Achieved
2. Reduction of damage to producers caused by poor milk quality. Reduction of TBC of all producers to below 100,000 bacteria/ml. Reduction in “human error” such as antibiotic milk, blood and acidity.  
98% of producers marketed milk with a TBC of below 100,000 bacteria/ml.  
There is a reduction in the amount of liters disqualified because of inhibitors. Acidity and freezing point need continuing attention.
3. Continued updating of the computer system to fulfill all of our professional demands for routine and research..  
The new software was launched on 1.1.2003
4. Continued counseling of herd mergers in all aspect of udder health, milking parlors, etc.
5. Producers that approached us were advised on all aspects of udder health, parlor design and equipment.
6. Updating the knowledge and professional capabilities of Advisers, Laboratory technicians and Veterinarians both in Israel and abroad.
7. Continued counseling of milk producers via field days, “Hadaf Halavan” (monthly news letter), market analysis of dairy equipment and accessories and other publications.

The second and enlarged edition of “**The handbook for the clinical veterinarian**” was published in 2002. “Hadaf Halavan” is sent to all producers every month and a market analysis was conducted.

8. A reduction in the time taken to forward answers to producers by use of the Internet.

Users of NOA already get direct answers. With the introduction of the new software information can be forwarded directly by e-mail or fax.

9. Continued eradication of *Streptococcus Agalactiae* with a reduction in uncooperative producers.
10. Reduction of *Staphylococcus Aureus* infections primly in the Moshav sector.
11. Reduction in the amount of infections by environmental pathogens with an emphasis on proper milking procedures and housing management.



## **Professional Goals for 2003**

- Reduction of the national SCC level to below 280,000. Our main effort this year is once again the Moshav sector.
- Continuing learning how to cope with the increasing amount of large herds as the result of mergers. (Herds with more than 1,000 head and robotic milking systems)
- Reduction in the amount of producers marketing poor quality milk with a high TBC. The amount of producers marketing premium grade milk (below 30,000 bacteria/ml.) must be above 80%.  
Together with the above said there is a need to change the standards for milk quality to those acceptable in major milk producing countries in the world.
- To prevent an increase in contagious pathogens to above their present level.
- Continued forwarding of cumulative information to all milk producers, and other interested parties.
- Making best use of the new computer software and hardware and automatic forwarding of answers to producers.
- Services and working procedures of the same standard as given to dairy cows for small ruminants.