Remembering Prof. Natan Ayalon

Nathan was born in the United States on the 2nd of February 1922. In 1944 he completed his studies in veterinary medicine and obtained a DVM degree at the Middlesex University (now Brandis University). Even at this early stage in his career he moved from village to village taking care of herds of cattle that he so loved. Imbued with Zionist ideals and an infinite love for the Land of Israel, he immigrated with his wife Tova in 1947 to live on Kibbutz Ein Dor of the Hashomer Hatzair movement to build a warm Zionist home.

His professional work in Israel started as the Professional Director of the Association for Artificial Insemination "On" (1948-1949). From 1949-1957 he served as Supervisor of Artificial Insemination in the Ministry of Agriculture and then from 1957 as Head and Director of the Fertility Center at the Kimron Veterinary Institute. For two years (1963-1964) Natan served as Acting Director of the Veterinary Institute and then returned to the Fertility Department, a position he held until his retirement.

Due to his vast clinical skills in the field of infertility, he was revered by farmers and stockmen all over the country, who all needed his services. He understood and realized that without the research of new methods there would be no breakthroughs in the field of fertility of cattle. In order to achieve this goal, I had the honor to be selected together with Professor Lindner from the Weizmann Institute to start work afresh in the field of hormone research in cattle.

One of the goals he set for himself was to clarify the differences between a cow with a "difficult" hormonal profile (those that did not fall pregnant after three inseminations) compared to the normal cow. Even if until today we do not know everything in this field, we managed to understand the hormonal profile of progesterone and estrogen in the cycling cow and to develop a hormonal pregnancy test for early pregnancy detection in cattle and sheep.

The team that Prof. Ayalon founded was impressive in their knowledge, rigor and imagination. These qualities have enabled the successful research into hormonal mechanisms in the pregnant cow, knowledge that to this day serves as a basis for further studies.

Natan devoted many hours to teaching students of veterinary medicine, medical students and to nursing staff on the subject of fertility. He taught at the Koret School of Veterinary Medicine since its inception in 1988.

His numerous scientific works have been widely published in the form of articles and book chapters. He made sure to provide diagnostic means to veterinary professionals working with sheep, cattle and poultry. His research work placed emphasis on measurements of hormones in the blood and excretions. He performed his laboratory research

using advanced and expensive equipment for that time period, including gas-chromatography, radiation counters, scanners to detect radioactivity and others. Prof. Ayalon also invested great effort in developing sensitive methods for testing hormones and the development of rapid methods for diagnosis.

In addition to his clinical and research work he was made a member of several professional societies, including the British Fertility Society and the SSR (Society for the Study of Reproduction) in the United States. Beyond all these, he was a great teacher who left behind him a generation of students who continue in his way, in the field of fertility research in Israel and in the world.

Prof. Mordechai Shemesh

Prof. Natan Ayalon: Selected References

1. Ayalon, N. and Tsur-Tchernomoretz, A.: The first outbreak of bovine trichomonia in Israel. Refuah Vet. 11: 111-115, 1954.
2. Ayalon, N. and Neeman, L.: Vibriosis in dairy cattle in Israel. Refuah Vet. 15: 146-148, 1958.
3. Ayalon, N., Weis, Y. and Harari, H.: Artificial insemination and fertility in Israel. Refuah Vet. 16: 73-83, 1959.
4. Ayalon, N. and Adler, J.: The use of mice in the Astwood Test for determination of small quantities of oestrogens. Refuah Vet. 17: 105-107, 1960.
5. Ayalon, N., Neeman, L., Harari, H. and Szidon, A.: A newly identified *Hemophilus spp.* acssociated with bovine vaginitis and cervicitis II. Clinical observations and experimental transmission. Refuah Vet. 17, 149-153, 1960.
6. Ayalon, N., Harari, H. and Mindel, Y.: Induced abortion in Friesian heifers. Refuah Vet. 18: 152-155, 1961.
7. Soller, M., Laor, M., Barnea, R., Weiss, Y. and Ayalon, N.: Polledness and Infertility in Male Saanen Goats. J. Hered. 54: 237-240, 1963.
8. Weis, Y. and Ayalon, N.: Artificial inseminatin of sheep in Israel. Refuah Vet. 20: 47-51, 1963.
9. Ayalon, N., Tadmor, A. and Lewis, I.: Surgical recovery of ova in the cow. Refuah Vet. 22: 161-164, 1965.
10. Padeh, B., Wysoki, M., Ayalon, N. and Soller, M.: An XX-XY hermaphrodite in the goat. Isr. J. Med. Sci. 1: 1008-1012, 1965.
11. Ayalon, N.: The use of hormones for oestrus synchronization. The Shepherd. 29: 34-36, 1968.
12. Shemesh, M., Ayalon, N. and Linder, R.: Plasma progesterone concentration in dairy cows during the oestrus cycle. Refuah Vet. 25: 265-270, 1968.
13. Shemesh, M., Ayalon, N. and Lindner, H.R.: Early effect of conceptus on plasma progesterone level in the cow. J. Reprod. Fertil. 15: 161-164, 1968.
14. Ayalon, N., Harari, H., Weis, Y. and Roderig, N.: Preliminary results on the use of pessaries for oestrus synchronization in sheep. The Shepherd. 30: 30, 1969.
15. Landau, B., Ayalon, N., Lewis, I. and Grunfeld, Y.: Interruption of pregnancy in mice by gonadotropin-inhibiting factor. Fertil. Steril. 20: 1023-1028, 1969.
16. Soller, M., Padeh, B., Wysoki, M. and Ayalon, N.: Cytogenetics of Saanen goats showing abnormal development of the reproductive tract associated with the dominant gene for polledness. Cytogenetics. 8: 51-67, 1969.
17. Ayalon, N.: Defective offspring and their cause in animals. Refuah Vet. 27: 29-30, 1970.
18. Ayalon, N., Landau, B. and Lewis, I.: Gonadotrophin-inhibiting substance in bovine urine. Int. J. Fertil. 15: 40-42, 1970.
19. Ayalon, N. and Weis, Y.: The influence of a teaser bull in oestrus detection. Refuah Vet. 27: 22-25, 1970.
20. Danieli, Y. and Ayalon, N.: The correclation between *Bedsonia* elementry bodies and the incidence of endometritis and fertility in a dairy herd. Refuah Vet. 27: 63-66, 1970.
21. Ayalon, N.: Advances in reserach connected with reproduction in sheep. The Shepherd. 32: 25-28, 1971.
22. Ayalon, N., Harari, H., Lewis, I., Posener, L.N. and Cohen, Y.: Relation of calving-to-service interval to fertility in dairy caows with differences in reproductive history, production levels and mangement. Refuah Vet. 28: 155-165, 1971.
23. Bassan, Y. and Ayalon, N.: Abortion in dairy cows inoculated with epizootic bovine abortion agent (*Chlamydia*). Am. J. Vet. Res. 32: 703-710, 1971.
24. Shemesh, M., Lindner, H.R. and Ayalon, N.: Competitive protein-binding assay of progesterone in bovine jugular venous plasma during the oestrous cycle. J. Reprod. Fertil. 26: 167-174, 1971.
25. Shemesh, M., Ayalon, N. and Lindner, H.R.: Oestradiol levels in the peripheral blood of cows during the oestrous cycle. J. Endocrinol. 55: 73-8, 1972.

26. Shemesh, M., Lindner, H.R. and Ayalon, N.: Affinity of rabbit uterine oestradiol receptor for phyto-oestrogens and its use in a competitive protein-binding radioassay for plasma coumestrol. J. Reprod. Fertil. 29: 1-9, 1972.
27. Tadmor, A. and Ayalon, N.: Surgical treatment of sucking in cows. Refuah Vet. 29: 169-173, 1972.
28. Gitelson, S., Ayalon, N. and Weissenberg, E.: Low pH beverages as a potential aid in the prophylaxis of cholera. Isr. J. Med. Sci. 9: 1594-1598, 1973.
29. Shemesh, M., Ayalon, N. and Lindner, H.R.: Early pregnancy diagnosis based upon plasma progesterone levels in the cow and ewe. J. Anim. Sci. 36: 726-729, 1973.
30. Ayalon, N. and Shemesh, M.: Pro-oestrous surge in plasma progesterone in the cow. J. Reprod. Fertil. 36: 239-43, 1974.
31. Abraham, A.S., Prodovsky, S. and Ayalon, N.: Isolation of IBR virus from the semen and seminal vesicles of bulls in Israel. Refuah Vet. 32: 7-9, 1975.
32. Ayalon, N.: Ova transfer in cattle - A review. Refuah Vet. 32: 26-31, 1975.
33. Ayalon, N. and Marcus, S.: Estrus synchronization and conception rate in dairy cattle treated with progestin-impregnated vaginal sponges. Theriogenology. 3: 95-100, 1975.
34. Weisenberg, E., Schoenberg, Y. and Ayalon, N.: A rapid method for monitoring low levels of di(2-ethylhexyl) phthalate in solutions. Analyst. 100: 857-861, 1975.
35. Ayalon, N.: The use of prostaglandins in veterinary medicine. Refuah Vet. 33: 41-43, 1976.
36. Ayalon, N.: New developments in embryo transfer in cattle. Refuah Vet. 33: 160-161, 1976.
37. Shemesh, M., Ayalon, N. and Linder, H.R.: Identification of phyto-estrogens in berseem clover. J. Agric. Sci. 87: 467-469, 1976.
38. Ayalon, N.: A review of embryonic mortality in cattle. J Reprod Fertil. 54: 483-493, 1978.
39. Shemesh, M., Allenberg, M., Milaguir, F., Ayalon, N. and Hansel, W.: Hormone secretion by cultured bovine pre- and postimplantation gonads. Biol. Reprod. 19: 761-767, 1978.
40. Shemesh, M., Ayalon, N. Shalev, E., Nerya, A., Schindlier, H. and Milaguir, F.: Mild progesterone measurement in dairy coms: Correlation with estrus and pregnancy determination. Theriogenology. 9: 343-352, 1978.
41. Shemesh, M., Ayalon, N. and Mazor, T.: Early pregnancy diagnosis in the ewe, based on milk progesterone levels. J. Reprod. Fertil. 56: 301-304, 1979.
42. Shemesh, M., Linder, R. and Ayalon, N.: Coumestrol and 4-O-methyl-Coumestrol in alfalfa grown in northern Israel: Possible effect of a folier pathogen (*Pseudopeziza medicaginis lib*). Refuah Vet. 1969: 1-7, 1979.
43. Shemesh, M., Milaguir, F., Ayalon, N. and Hansel, W.: Steroidogenesis and prostaglandin synthesis by cultured bovine blastocysts. J. Reprod. Fertil. 56: 181-185, 1979.
44. Marcus, S., Lewis, I. and Ayalon, N.: Breeding soundness examinations of beef bulls in Israel. Refuah Vet. 56: 88-96, 1980.
45. Ayalon, N.: Embryonic mortality in cattle. Zuchthyg. 16: 97-109, 1981.
46. Marcus, S. and Ayalon, N.: Improving conception rate in dairy catle using progestin-impregnated intravaginal sponges. Refuah Vet. 38: 55-56, 1981.
47. Shemesh, M., Ayalon, N., Marcus, S., Danielli, Y., Shore, L. and Lavi, S.: Improvement of early pregnancy diagnosis based on milk progesterone by the use of progestin-impregnated vaginal sponges. Theriogenology. 15: 459-462, 1981.
48. Abraham, A.S., Ayalon, N. and Marcus, S.: An outbreak of IBR/IPM infection in bulls and dairy cattle in Israel: 1. Clincial and diagnositic aspects. Refuah Vet. 39: 93-98, 1982.
49. Abraham, A.S., Ayalon, N. and Marcus, S.: An outbreak of IBR/IPM infection in bulls adn dairy cattle in Israel: 2. Vaccination of bull at artificial insemination centers. Refuah Vet. 39: 98-103, 1982.
50. Ayalon, N., Feingold, D. and Almeida, A.: Disturbed ovulation and summer infertility in Israeli Friesian cows. Refuah Vet. 39: 62, 1982.
51. Shemesh, M., Ayalon, N., Lavi, S., Mileguir, F., Shore, L.S. and Toby, D.: A new approach to the use of progesterone levels for pregnancy determination. Br. Vet. J. 139: 41-48, 1983.
52. Ayalon, N.: The repeat breeder problem. Vlaams Diergeneeskundig Tijdscrift. 53: 230-239, 1984.
53. Almeida, A., Ayalon, N. and Bartoov, B.: Bovine endometrial ultrastructure 6 and 7 days post-breeding. Anim. Reprod. Sci. 10, 293-300, 1986.