Nutritional status of the Patagonian huemul corroborates health problems in this refugee species

Jo Anne Smith-Flueck[A,*], Werner T. Flueck[B,C,D] and Natalia Demergassi[E]

[A]Theriogenology Laboratory of 'Dr Héctor H. Morello', Faculty of Agrarian Science, IBAC-CITAAC, Universidad Nacional del Comahue, Cinco Saltos 8303, Argentina.
[B]National Council of Scientific and Technological Research (CONICET), Buenos Aires, Argentina.
[C]Swiss Tropical and Public Health Institute, University Basel, Kreuzstrasse 2, 4123 Allschwil, Switzerland.
[D]National Parks Argentinos, Bariloche, Argentina.
[E]Department of Conservation, Education, Science and Health. Foundation Temaikèn. Escobar, Buenos Aires, Argentina.
[*]Corresponding author: Email: j.smith@deerlab.org

The endangered Patagonian huemul (*Hippocamelus bisulcus*) may be the only cervid species confined year-round to its historic summer range in the mountains. Once migratory, human encroachment of the lower valleys turned this species into an Andean refugee;[1] this loss of migratory behavior has potentially contributed to trace mineral deficiencies and associated health problems, considering many minerals are depleted at these higher altitudes. Se and Iodine have been hypothesized to explain the reported prevalence of osteopathologies and tooth-loss syndrome,[2,3] which can impact foraging efficiency and predator avoidance behavior, leading to the observed low average longevity and lack of population recovery. To evaluate the nutritional status of huemuls, we analyzed blood from wild and captive individuals (2021 to 2025) at Shoonem Protected Park for concentrations of vitamins and trace minerals. Selenium (Se) was also measured in hair samples collected from wild animals (n = 16) from 1993–2020. Given non-established nutrient requirements for this species, we evaluate our results based on recommendations for other ruminants.[4–10] We found severe deficiencies in hormone T3 and Vitamin D3 for all sampled individuals (n = 6 and 10, respectively; Fig. 1). For Se (n = 9) in blood, both wild cases were low in Se, but once at breeding center under a supplemental feeding program, samples from only two individuals (H & I) rose to marginal levels (Fig. 1). Se content in hair samples of 16 wild individuals (Fig. 2) showed only 19% with adequate levels. For Zn (n = 9), 77.8% were deficient and 22.2% at borderline deficiency (Fig. 1). For Mn (n = 6), five were considered deficient and one at lowest level of adequacy; for Mo (n = 5), three individuals showed deficiency, while two cases were at the lowest adequacy levels; for Vitamin B12 (n = 4), all had inadequate levels with two deficient and two at marginal levels. For Cu (n = 10), three had marginal levels with all remaining cases at adequate levels. Only Co (n = 6) had adequate levels for all samples. An ongoing supplemental program for this species using adaptive management strategies and a conservation project to reintroduce them to historically optimal habitats, which incorporates this new information, will be discussed.

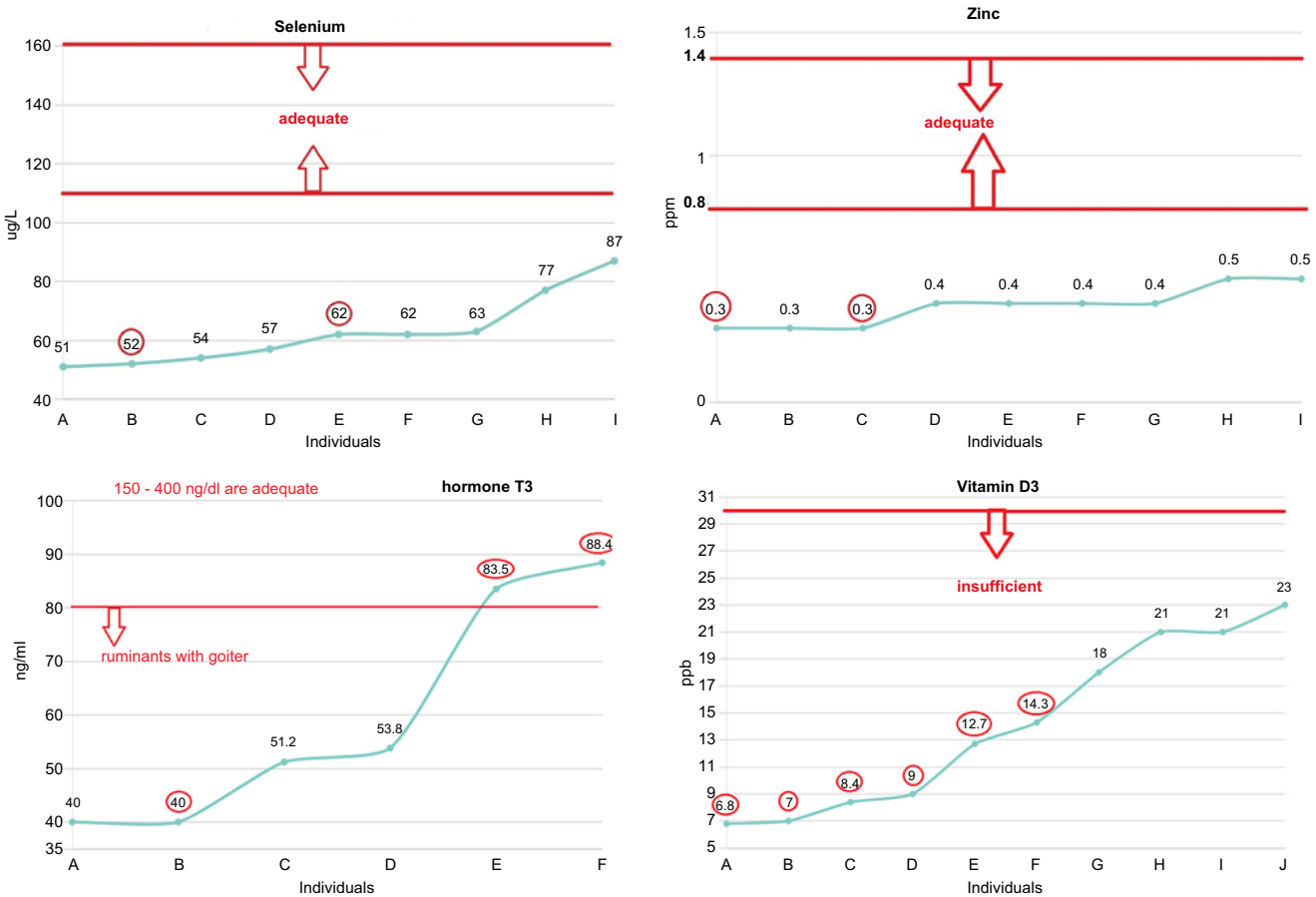

Fig. 1. Blood profile values for nutrients that indicated inadequate levels in all sampled individuals. These values include results for selenium, zinc, iodine, and cholecalciferol (vitamin D3). Red circled data were samples collected from wild individuals. All others were animals at least one year in the Shoonem Breeding Center.

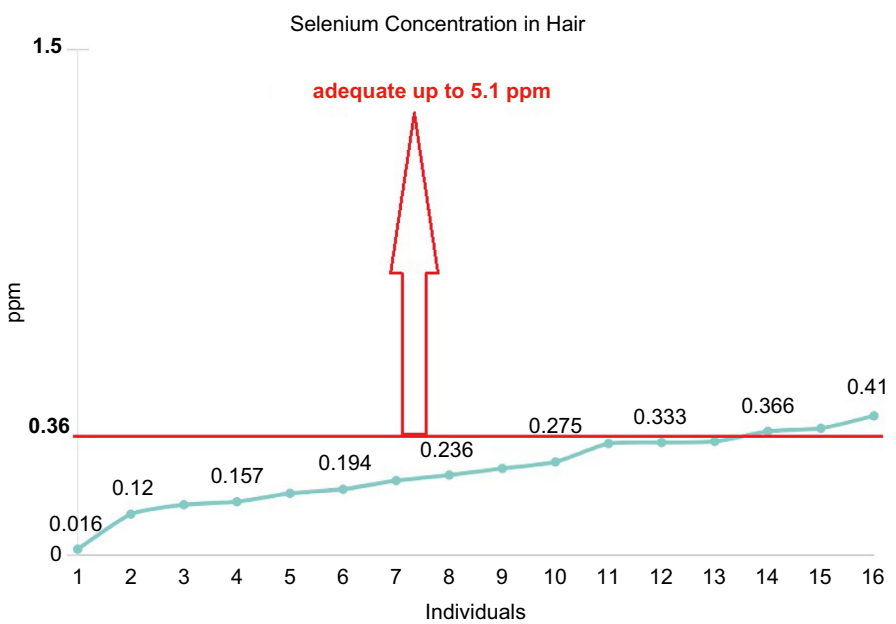

Fig. 2. Selenium (Se) values for hair samples collected from free-ranging huemul from 1993–2020 in various locations of the Patagonian Andes. See Ref. 9 and 10 for Se reference values in hair.

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11TH INTERNATIONAL DEER BIOLOGY CONGRESS

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This Collection of full papers and short communications records the plenary presentations and oral and poster presentations submitted at the 11th International Deer Biology Congress, held in Dunedin, New Zealand in February, 2026. The Congress was attended by more than 190 scientists from Asia, North and South America, Europe and Oceania and covered a wide range of topics in deer biology. These included deer products and farming systems, deer health and welfare, physiology, nutrition, genetics, ecology, deer conservation, and the management of wild deer populations. Field trips during the Congress demonstrated New Zealand deer farming and the role of science in supporting this industry, and also the significance of native animal and plant conservation in Aotearoa-New Zealand.

There were nine plenary papers, presented by Cam Speedy and Kaylyn Pinney (The value and consequence of your deer here – a cultural paradox), Iain Gordon (Forty-five years of studying deer: a personal; reflection of the past, present and future of deer research), Kurt VerCauteren (Managing agricultural damage and disease of deer through applied research: one team's contribution), Suzanne Rowe (Development of genomic tools for genetic improvement in New Zealand deer), Jim Heffelfinger (Cervid conservation in North America: managing across a mosaic of jurisdictions), David Hazlerigg (What can chronobiology tell us about cervids? What can cervids tell us about chronobiology? And why should we care?), Kevin Monteith (Nutritional legacies across space and time: evidence for a nutritional ecotype), Chunyi Li (Antler stem cells: discovery, attributes and potential clinical applications) and Hayato Iijima (A history of deer management and abundance estimation in Japan: past lessons and future challenges).

The tradition of awarding the Tony and George Bubenik Memorial Award was continued at this Congress. This prize is awarded to the early researcher who is judged by a panel to have presented the best oral paper at the Congress. There were nine candidates. The prize was awarded to Amanda Van Buskirk for her oral presentation 'Estimating deer density with

camera and unmarked models to guide population management'.

The Collection editors are Assoc. Prof Gordon Dryden (The University of Queensland, Gatton, Australia) and Assoc. Prof Francisco Ceacero (Czech University of Life Sciences, Prague, Czechia).

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