NZ Red velvet antler compares well

Studies to continue

As part of its overall strategy of further developing the international velvet antler market, the GIB is financing a research programme at Invermay. In this article, Dr Peter Fennessy and Syd Duncan of AgResearch, Invermay Agricultural Centre summarise some of the results from stage one of this work.

THE FIRST stage of the programme involved a basic analysis of the chemical composition of New Zealand Red velvet antler and compared it with small samples of velvet from the principal competitors — Russia and China. (See Table 1.)

The antlers were cut into sections and analysed for total minerals (ash content), lipid (the fatty components), plus a number of individual minerals.

Ash content is an indication of the degree of mineralisation or bone formation and the lipid is the principal component of the well-known Russian velvet antler extract, pantocrin.

The 17 NZ Red antlers were all graded according to the GIB guidelines, with all but three being super A (2) or A (12).

To investigate the effect of the stage of growth on composition, six NZ Red 2 year-olds were harvested: One antler was cut at 55 days after casting and the other was cut 43 to 67 days after casting (see photo).

The NZ Red antlers were obtained from farms around the country, with the 2-year-old velvet antler coming from Invermay. The Russian and Chinese velvet antlers, selected as representing the better quality end of the market, were bought in Hong Kong.

- **Average composition**

Table 2 shows that on average, the different groups of antlers had similar ash contents, although there was a trend for the earlier cut of NZ Red velvet (the 2-year-old) to have less ash and the Russian and Chinese Meihaulu to have more.

The calcium contents reflect the ash contents — not surprising considering calcium made up about one-third of the ash. However, there were large differences in lipid content where the Russian and Chinese Malu were markedly lower than the rest.

- **Variability**

The variability between antlers in the same group was considerable and highlights the perils of making conclusions based on small samples. (Ref Table 3.)

In this respect, only the two NZ Red and Russian samples are considered adequate. As well, the analyses of the Russian velvet antlers are similar to Russian data for the top quality product shown in Table 4 (Type 1, 3- and 4-branch).

This is as expected, considering the stage of growth of the velvet antlers analysed in our study.

Note: Type 1 has a rounded end without signs of ossification; type 2 has an insignificant sharpness at the tips with some signs of ossification and a slightly porous cut surface; type 3 has sharp tips with lumps and grooves on the surface, obvious signs of calcification and damaged velvet skin.

- **Stage of growth**

A major source of variability is the stage of growth at harvest. This is indicated by an average of about four per cent between type 1 and type 2, and type 2 and type 3.

In our study we were also interested in clarifying the effect of the stage of growth on composition. The velvet antler from six 2 year-old stags was harvested at specific times after casting. One antler was cut from each stag at 55 days after casting and the other at 43 to 67 days.

The composition of the latter was then expressed relative to the control cut at 55 days. This enabled us to calculate the rate of change in ash and lipid content with stage of maturity at harvest.

The rates of change over the 43 to 67 day period were: Ash increased by about six per cent over the 24 days, and lipid decreased by about one per cent over the 24 days.

- **More on variability**

Although stage of growth does influence composition, there was still considerable variability at the same ▷

TABLE 1. Weight details of velvet antlers analysed (± standard deviation) for sample sizes of 6 or more individual antlers; note processed antlers contain about 15% moisture).

	Number	Processed dry weight (kg) Mean ± SD	Range
Russian	6	1.37 ± 0.57	0.73-2.18
NZ Wapiti	3	0.92	0.65-1.34
NZ Red top grade	17	0.53 ± 0.14	0.32-0.92
Chinese Meihualu	3	0.51	0.44-0.57
Chinese Malu	3	0.48	0.42-0.56
NZ Red 2-year-old	6	0.22 ± 0.05	0.13-0.25
Australian Rusa	3	0.22	0.19-0.25
NZ Sika	2	0.15	0.11-0.18
NZ Fallow	4	0.066	0.044-0.079

TABLE 2. Average values for components of velvet antler.

	No.	Components as % of dry antler Ash	Lipid	Calcium
NZ Red 2-year-old 55 day	6	33.1	2.81	11.2
NZ Red top grade	17	34.0	2.50	12.1
Russian	6	35.5	1.48	12.9
Chinese Meihualu	3	35.7	2.46	13.0
Chinese Malu	3	34.1	1.39	11.9
NZ Fallow	4	32.0	2.64	9.9

▷ stage of growth as indicated for the six 2 year-old stags cut at 55 days.

The range in ash content was 3.3 per cent in this group and the range in lipid content was one per cent — the lipid value being very similar to that for these same stags over the 24 day period.

That is, the amount of variability in lipid between Red stags all cut at the same stage of growth was similar to that occurring in any one stag over a period of 24 days.

The variation in ash content at the same stage of growth was about half that occurring over the 24 day period.

- **Causes of variability**

It seems likely that genetic factors are very important. Similarly, environmental factors are likely to be important. However, in this study all the stags were run together at Invermay but other environmental factors like the type of feed the individual stag selected or the health of the stag could be important.

We need a rapid method of determining the important components in velvet antler without destroying the antler to do so, to advance our understanding in this area.

- **Conclusions**

In terms of simple composition, the top grade NZ velvet antler has a similar mineral content to its principal competitors and a higher lipid content.

Consequently, at this stage we can say the NZ Red velvet antler is likely to be of at least comparable quality to the Russian and Chinese products.

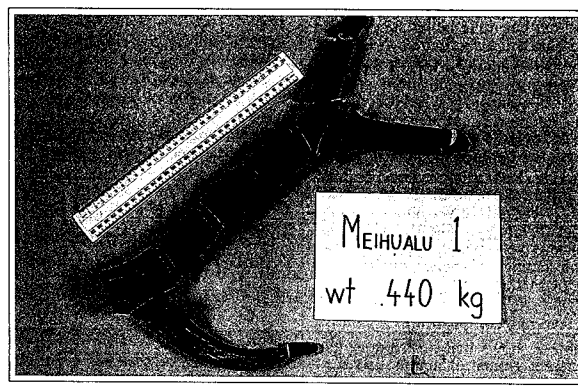
The next stage of the programme is to develop laboratory tests to evaluate velvet antler in terms of its effects on cell lines. This work is now underway at Invermay. □

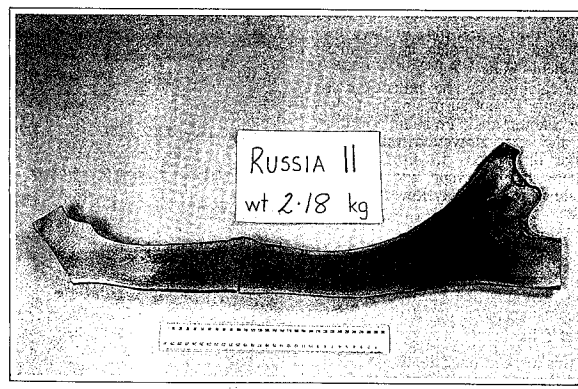
TABLE 3. Range in % of total minerals and lipid within the velvet antler groups.

	No:	Component as % of dry antler	
		Ash	Lipid
NZ Red 2-year-old 55 day	6	31.4-34.7	2.70-3.68
NZ Red top grade	17	30.0-37.4	1.71-3.67
Russian	6	32.9-37.1	1.24-1.95
Chinese Meihualu	3	35.0-36.9	2.00-2.71
Chinese Malu	3	31.3-37.7	1.17-1.64
NZ Fallow	3	31.6-32.4	2.16-3.57

TABLE 4. Average values for the ash content of Russian velvet antler from Maral stags harvested at various stages (data from Gavrin, 1976).

Type[1]	3-branch	4-branch	5-branch	6-branch
1	33.1	35.7	40.2	40.9
2	37.1	40.4	44.7	45.1
3	40.7	43.6	48.4	50.5





Above right: Chinese Meihaulu top grade antler
Sliced for analysis

Below right: Russian antler slit longitudinally (excluding the trez tine) after an estimated 80 days of growth
Note the high blood content and relative lack of calcification at the base