LETTERS TO THE EDITOR

Sports drinks and teeth

EDITOR.—In a previous issue of this journal Dr Milosevic published an article entitled “Sports drinks hazard to teeth.” The article described the erosive potential of sports drinks based on analysis of pH and buffer capacity. Moreover, a case was presented of an athlete who had appreciable dental erosion due to regularly drinking a still isotonic sports drink from a pouch. Both the title and the case presented gave the reader the impression that there is a direct relation between sports drink consumption and dental damage. We consider that the article contains erroneous and misleading information.

FALSE pH VALUE
The author gave the pH of Isostar (a powder based drink) as 2.38 (the lowest value of all the drinks listed)! This figure is wrong and must be based on either a wrong measurement, typing errors, or testing of an old product no longer marketed. Actual measurements by Professor JM ten Cate, Department of Cariology and Endodontology, Academic Centre for Dentistry (ACTA), Amsterdam, the Netherlands, as well as measurements in our own laboratories of all Isostar powder and liquid products in stock at the moment in England (24 March 1997), confirm that the true pH values for Isostar powder based drinks are: lemon pH 4.1, orange pH 4.08. The liquid products have comparable values.

Results from an internal study at ACTA, Amsterdam, finished in 1994, showed that Isostar orange with a pH of 4.0 and a relatively low buffer capacity showed appreciably less erosion than a variety of other tested soft drinks—namely, fruit juices and competitive sports drinks (ten Cate JM, unpublished data). Moreover, it was shown that mixing the drink with artificial saliva (10 and 50% mixtures) results in a pH that is even above the critical pH of 5.5. Based on these data Novartis Nutrition decided to set the pH of all Isostar drinks at 4.0, while having a relatively low buffer capacity. These facts about Isostar are in marked contrast to the impression made by Dr Milosevic’s article, which meanwhile has been cited by the international press.

NO DIRECT EVIDENCE
Dr Milosevic presented no direct evidence on a relation between sports drink consumption and dental erosion as can be seen by the following phrases from the article:

- “Sports drinks had the same cariogenicity as fruit juice and carbonated beverages. However, levels of decay were not significantly different between a group of Swedish school athletes and a non-athletic control group.” (page 28)
- “A five day fluid intake record showed that hot beverages were rarely consumed, the subject (of the dental damage case presented) preferring fresh fruit juice and carbonated beverages.” (page 29)
- “The assumption was made unequivocally to the sports drink since the subject (from the case presented) also drank fresh fruit juice and carbonated beverages. Such drinks are potentially erosive…” (page 30)
- “Ranking the erosive potential of the sports drinks is thus difficult.” (page 30)

Thus it must be concluded that the author fails to support his opinion with direct evidence. Moreover, the citation of an incorrect pH value has in an unacceptable way brought discredit to the product Isostar—a product that is based on sound scientific research, including the aspect of dental erosion.

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Author’s reply
EDITOR.—I would like to respond to the above letter from Drs Brouns and Muntjewerft of Novartis Nutrition AG about my recent article “Sports drinks hazard to teeth.” They make a number of points with which I must take issue.

I refute the suggestion that my paper contained erroneous and misleading information. Having repeated the Isostar pH measurement, I am satisfied that the results of the tests that were performed on all of the drinks under consideration were accurate, including the pH values.

As mentioned in the article the calcium, phosphate, and fluoride concentrations of the drinks were examined as well, which are all relevant factors when considering potential for dental erosion.

I did not single out Isostar from the other drinks under examination, still less did I discredit it as a product. In fact, Isostar came out of the study favourably as the relatively high concentrations of calcium and phosphate in the drink would, as I said in the article, tend to reduce any erosive potential.

I consider my paper to be well balanced and, read as a whole, my message to the profession was clear. The results of my study corroborate the findings of earlier papers that these types of drink have the potential to cause dental erosion. There is, in my view, need for greater awareness of this issue and also for further research.

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Table 1

<table>
<thead>
<tr>
<th>Source of drugs</th>
<th>Drugs used (%)</th>
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<tbody>
<tr>
<td>Doctor/general practitioner</td>
<td>61</td>
</tr>
<tr>
<td>Black marketer</td>
<td>20</td>
</tr>
<tr>
<td>Proximity network</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Drugs prescribed by a doctor (that is, stimulants, corticoids, anabolic-androgenic steroids, diuretics) were quoted by two thirds of the subjects (61%). Their usual general practitioners were most often the prescriber and, according to the athletes, the prescription was usually written by a black market, and the proximity network (table 1).

Drugs prescribed by a doctor (that is, stimulants, corticoids, anabolic-androgenic steroids, diuretics) were quoted by two thirds of the subjects (61%). Their usual general practitioners were most often the prescriber and, according to the athletes, the prescription was usually written by a drug provider that their anonymity was strictly respected. The working sample comprised 58 men and 15 women aged between 17 and 45 years (mean (SD) 25.8 (6.9)), including seven elite athletes and 66 athletes involved in national or regional level events (no body builders and no power athletes). The drugs most commonly abused were stimulants (46%), narcotics (29%), corticoids (9%), anabolic-androgenic steroids (4%), diuretics (4%), and other (8%). Use of more than one drug was reported by 13 athletes. Three subjects used drugs without knowing their names.

RESULTS
Subjects obtained drugs through three main networks: doctors, the black market, and the proximity network (table 1). During a study among 2000 French amateur athletes of both sexes aged 17 and above, 186 subjects admitted that they had used prohibited substances in the previous 12 months, and 73 agreed to answer a questionnaire on the drugs they had obtained from these networks.

METHODS
Subjects were recruited during a study among 2000 French amateur athletes from the French National Elite Sports Institute. The study was conducted between 1991 and 1995, and the presence of stimulants was assessed by testing urine samples. During this period the athletes were tested five times, with each test being on a different day. The athletes were asked to fill out a questionnaire at the end of each testing session. The questionnaire included information on the type of drug taken and the reason for taking it. The results were then compared with the drug test results. The questionnaire was anonymous, and the athletes were not identified in any way.

DISCUSSION
General practitioners do encounter doping in sport: in France, one in three during the past 12 months.1 In 1991, of 517 family doctors and paediatricians in Texas, 35% reported being asked about steroids or seeing possible steroid users in their practices during the previous five years. Finally, a number of doctors prescribe prohibited drugs through their athletes' physicians or being fooled by the athlete making the request. Practitioners must therefore improve their knowledge of doping, and con-
Sports drinks and teeth.

F Brouns and L Muntjewerf

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