

## 6 Summary

Since the nineteen seventies the policy on cannabis use in The Netherlands has substantially been different from that in many other countries. It is based on the idea that separating the markets for hard and soft drugs prevents cannabis users to resort to hard drug use. Over the years so-called coffee-shops emerged. Coffee-shops are alcohol free establishments where the selling and the use of soft drugs is not prosecuted, provided certain conditions are met. Many of the cannabis products sold in these coffee-shops originate from Dutch-grown grass called 'nederwiet'. On behalf of the Ministry of Health, Welfare and Sports we investigate the potency of cannabis products as sold in coffee-shops in The Netherlands.

$\Delta^9$ -Tetrahydrocannabinol (THC) is the main psychoactive compound in marihuana and hashish. The aim of this study is to investigate the concentration of THC in marihuana and hash (=cannabis resin) as sold in Dutch coffee-shops. In addition we examined whether there are differences between the cannabis products originating from Dutch grown hemp (nederwiet) and those derived from imported hemp. This is the thirteenth consecutive year that this study has been performed. Besides THC, the content of two other cannabinoids, cannabidiol (CBD) and cannabinal (CBN), are measured.

The names and addresses of 50 (out of a total of 666) Dutch coffee-shops were randomly selected. For the purpose of this study, 58 samples of nederwiet, 14 samples of imported marihuana, 11 samples of Dutch hash and 57 imported hash samples were anonymously bought in the selected coffee-shops. In addition, 48 samples of the most potent (herbal) marihuana product available were bought<sup>9</sup>. As a rule samples of 1 gram were bought. Samples were bought anonymously.

Traditionally hash contains more THC than marijuana. The average THC-content of all the marihuana samples together<sup>10</sup> was 14,9% and that of the hash-samples 19,2%. The average THC-content of nederwiet (15,5%) was significantly higher than that of the imported marihuana (5,7%). The average THC-percentage of the marihuana samples that were bought as most potent (16,9%) did not differ from that of the most popular varieties of nederwiet (15,5%). Hash derived from Dutch marihuana contained more THC (35,0%) than hash originating from foreign cannabis (16,1%). The average THC-percentage of nederwiet was lower in 2012 than in 2011 (15,5 vs. 16,5%), but this difference was not statistically significant. The THC-percentage in imported hash was significantly higher than the year before (16,1% in 2012 versus 14,3% in 2011).

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<sup>9</sup> Most potent as indicated by the coffee-shop personnel.

<sup>10</sup> This is not corrected for in terms of relative contribution of number of foreign or Dutch samples.

There is some evidence that not only the THC-content is indicative for the effects and risks of cannabis, but that CBD might attenuate some of the negative effects of THC. This means that cannabis with a high CBD / THC ratio would have less negative health consequences than cannabis that has little or no CBD. Nederwiet has very low levels of CBD (median = 0,3%), whereas imported hash contained on average 6,9% CBD.

The ratio between CBN and THC can give an indication of the freshness of the preparation (Ross and Elsohly, 1997). Levels of CBN were higher in imported marihuana and hash compared to products derived from homegrown cannabis. Also the ratio of CBN/THC was significantly higher in the imported products. The ratio was higher in imported marijuana compared to nederwiet and in imported hashish as compared to hashish made from nederwiet.

Prices that had to be paid for imported marihuana were lower than those for any of the other cannabis products. The prices of hash made from nederwiet were higher. The average price for a gram nederwiet was €9,28 per gram, for a gram of imported marihuana €5,88 and for a gram of imported cannabis resin €9,71.