20 Years proficiency testing GTFCh

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Aim: Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards. Methods: Proficiency tests are part of the internationally accepted accreditation procedure for forensic laboratories according to DIN EN ISO 17025. The GTFCh is the organizer of proficiency tests for forensic purposes. Technical and organizational tasks are regulated by the ARVECON GmbH. Results and Discussion: In 1994, the Federal Government introduced a draft bill amending §24a of the StVG (Road Traffic Act) under which the driving of motor vehicles under the acute influence of narcotics was to be punished as an administrative offence. Tetrahydrocannabinol, morphine and benzoylecgonine were listed as drugs to be tested for. Additionally tetrahydrocannabinolic acid, cocaine and amphetamine were included in the tests. The GTFCh authorised the Institute of Legal and Traffic Medicine of the University Heidelberg to organise the proficiency tests. Until the end of 1996 four tests for drugs in serum were realised. In 1998 the results were published in a report of the BASt (Federal Highway Research Institute). After this the proficiency testing scheme was continued by order of the GTFCh and continuously expanded. In the following 20 years 24 further proficiency tests were included in the scheme and the number of tests was expanded of 2 in 1995 to 76 in 2017. In that period the number of participations increased from 160 in 1996 to 3500 in 2016. Until 2016 laboratories of 34 countries have participated in the proficiency tests. Conclusion: The implementation of the proficiency tests for forensic analyses in Germany led to the increased introduction and application of reliable methods.

1. Introduction
Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards. Proficiency tests are part of the internationally accepted accreditation procedure for forensic laboratories according to DIN EN ISO 17025 [1].

2. Methods
The GTFCh is the organizer of proficiency tests for forensic purposes. Technical and organizational tasks are regulated by the ARVECON GmbH. Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards [2, 3].

3. Results and Discussion
In 1994, the Federal Government introduced a draft bill amending section §24a of the StVG (Road Traffic Act). Accordingly, driving of motor vehicles under the acute influence of narcotics is to be punished with a fine and a license suspension. Initially, tetrahydrocannabinol, morphine and cocaine had been included as drugs to be tested. The aim of the interlabo-
A laboratory test was to prove that an adequate number of laboratories in Germany were able to perform the analyses with sufficient accuracy and precision.

The GTFCh authorized the Institute of Legal and Traffic Medicine, Heidelberg, to organize the tests. Until the end of 1996, four drug tests in serum were realized. At the beginning of the proficiency test program, the participants came exclusively from the members of the GTFCh. Over the years, the number of participants has grown steadily from within Europe and subsequently from outside Europe. In 1998, the results were published in a BASt report (Federal Highway Research Institute, Bergisch Gladbach) [4]. Then, the proficiency-testing scheme was continued by the GTFCh and continuously expanded (Fig.1).

![Fig. 1. Time course from 1995 until 2017.](image)

In the following 20 years, 24 further proficiency tests were included and the number of tests was expanded from 2 in 1995 to 76 in 2017 (Fig.2). In that period, the number of participations increased from 160 in 1996 to 3500 in 2016 (Fig.3).
Origin of participants

Until 2016, laboratories of 34 countries have participated in the proficiency tests covering forensic and clinical toxicology as well as therapeutic drug monitoring (Fig.4). Primarily proficiency tests are an instrument for external quality assurance, but the remaining sample material of the tests is also useful for internal quality assurance.

At the beginning of the proficiency test program the participants came exclusively from the members of the GTFCh. Over the years, the number of participants has grown steadily from within Europe and subsequently from outside Europe.
Fig. 4. Origin of participants.

<table>
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<td>16</td>
<td>Singapore, Bosnia Herzegovina</td>
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Fig. 5. List of all countries with their total number (N).

4. Conclusion

The implementation of the proficiency tests for forensic analyses in Germany led to the introduction and application of reliable methods. Quality-assured toxicological analyses constitute an essential aspect allowing subjects to be treated equally in law.

5. References