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A method of accelerated eradication of bovine brucellosis in the Czech Republic

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Summary

A method of accelerated eradication of bovine brucellosis was developed and applied in the Czech Republic, where livestock was reared primarily in large-scale units. Before this method was adopted, annual economic losses were about US$ 20 million and thousands of people were estimated to suffer from brucellosis (e.g. 32.4% of tested veterinarians were positive). Initial mass serological testing confirmed 654 outbreaks with 99,787 intrafocal bovines distributed in half of the regions of the Republic. Disease incidence was 213 with a prevalence of 676 per 100,000 bovines. Systematic investigations detected all affected herds, including 91 new outbreaks. A depopulation policy was applied on farms and ranches with brucellosis-infected cattle, with the aim of totally eradicating the disease by a fixed deadline. Breeding on diseased ranches was temporarily discontinued and affected herds were replaced by healthy cattle from brucellosis-free regions. Since then, the incidence of the disease in cattle and humans has been maintained at level zero. Eradication without recurrence was achieved within five years, without reducing the cattle population, the rate of cattle production, or the income of farmers. Ten years after the eradication of the disease, the cumulative benefit/eradication cost ratio reached 7:1. Post-eradication surveillance has confirmed a brucellosis-free status. The eradication of bovine brucellosis has resulted in an increase in cattle production and trade. By 2000, eradication had averted losses of approximately US$ 700 million and saved more than two thousand people from becoming affected with this zoonosis.

Keywords

Benefit-cost – Bovine brucellosis – Depopulation – Disease control – Eradication – Surveillance – Zoonosis.

Introduction

The Czech Republic comprises an area of 78,858 km^2 with ten million inhabitants and about three million head of cattle (in 1960). Brucellosis caused by *Brucella abortus* had been reported since 1924, affecting mainly large-scale ranches located in the fertile lowlands which had a high concentration of dairy cows. Vaccination of calves (four to seven months old) with strain B-19 started before the Second World War. Adult cattle from affected farms were also vaccinated, with the exception of animals in advanced pregnancy. Serological control in that period was rather *ad hoc*. Mandatory reporting was introduced in 1952. Two decades after mass vaccination with strain B-19 and despite all the efforts and measures deployed, the brucellosis situation worsened with many new diseased animals and outbreaks being detected. Measures such as isolation of diseased animals and affected herds, veterinary control of cattle movement, and regulation of trade and breeding (even some insemination stations were found to be affected) were not always perfect (relying too heavily on vaccination). False negative results of serological tests contributed to disease spread. Direct and indirect economic losses in the livestock industry and trade were about Kcs 200 million (US$ 20 million) annually. In the human population, in addition to the estimated thousands chronically suffering from brucellosis, many new acute cases were reported as a consequence of exposure to affected animals, ranches or slaughterhouses and due to consumption of infected or contaminated milk or milk products. A special survey among 479 veterinarians was carried out with the following results: 32.4% were serologically positive and 17.5% manifested

clinical symptoms (19). Such alarming findings led to the initiation of an eradication programme covering the entire territory of former Czechoslovakia.

By 1960, most countries in the world had reported the occurrence of bovine brucellosis. Only a few countries managed to eradicate the disease using the 'test and slaughter' method, namely Cyprus in 1932 (17), Norway in 1953 (18), Sweden in 1957 (17), Bulgaria in 1958 (17) and Finland in 1960 (5). International recommendations at that time dealt with laboratory diagnosis, immunisation and local case solutions, but not with country level eradication procedures (6). Rapid eradication at national level required developing suitable and feasible procedures, which were appropriate to the given epizootiological situation, country-specific and subject to fixed deadlines.

This paper deals only with the eradication of the disease in the Czech Republic. An eradication programme was implemented simultaneously in Slovakia.

The following data concern brucellosis in Slovakia (figures in brackets refer to the whole of Czechoslovakia). In 1959, 57.88% (54.6%) of the cattle population was tested. The disease was discovered in 18 (52) out of 33 (108) regions, involving 1,177 (1,831) outbreaks with 98,860 (198,647) intrafocal bovines, i.e. 7.51% (4.61%). The incidence reached 2,259 (8,558) diseased animals, i.e. 174 (202) per 100,000 animals and disease prevalence on 31 December 1959 was 78,115 (98,596) diseased animals, i.e. 5.93% (2.29%).

The pre-eradication (preparatory) phase

The first countrywide serological survey in 1959 covered 52.49% of the cattle population, including all females of reproductive age. The disease was discovered or confirmed in 34 of 75 regions, including 654 localities with 99,787 intrafocal bovines (3.34%), i.e. 153 animals per outbreak (half of these were dairy cows). Of all the outbreaks, 99% occurred in dairy ranches and only 1% in small farms. The number of newly detected positive cattle was 6,299 animals, i.e. 213 per 100,000 with a prevalence on 31 December 1959 of 20,481 diseased animals, i.e. 676 per 100,000 animals. Territorial distribution is shown in Figure 1.

Knowledge of bovine brucellosis characteristics and diagnosis was considered to be sufficient for eradication. The decision was therefore made to initiate the programme as soon as possible, without waiting for further results of national and international research, considering that later, the situation would worsen (with the risk of introducing the disease into wildlife), i.e. be much more difficult and expensive to manage. The same approach was applied to bovine tuberculosis control.

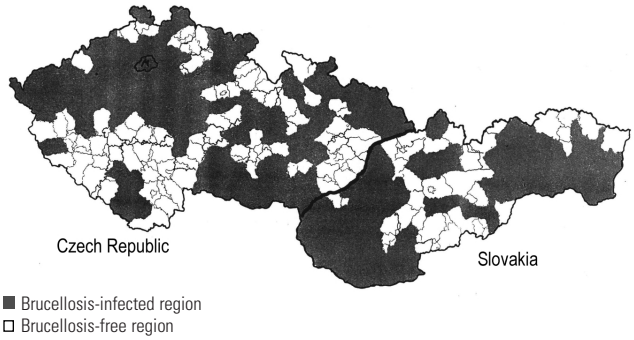

Fig. 1
Distribution of brucellosis-infected cattle in Czechoslovakia, January 1959

Initially, the veterinary community and decision-makers had to be convinced about the methodology to be adopted and the economic feasibility of brucellosis eradication at national level within a short period of time. In 1959, based on complex analysis and recommendations presented by veterinary and public health services, the Government of the former Czechoslovakia adopted a resolution to eradicate bovine brucellosis (goal – zero incidence) and to eliminate bovine tuberculosis (goal – zero prevalence). The Government created a special committee (representing relevant ministries and institutions), chaired by the Director of the State Veterinary Service, identified subsidies, introduced obligatory pasteurisation of market milk and issued appropriate directives for administrative authorities and cattle owners (12, 13, 14). The aim of the programme was to eradicate bovine brucellosis using simple depopulation of affected farms and ranches and to meet the objective, by 1965, of zero prevalence and incidence without recurrence (eradication of all sources of *Brucella abortus*), without reducing national milk and beef production, cow populations or the income of farmers. For the first time, a fixed deadline was imposed upon a national animal health programme. This was different compared to the previous attempts of trying to fulfil long-term disease control programmes without fixed deadlines for achieving the specific targets of reducing or eliminating disease occurrence.

One of the first steps implemented was to discontinue vaccination with strain B-19, which had been useful in reducing negative impacts (abortions, disease spread, etc.), but was not suitable for the new task, i.e. speedy final eradication. An additional reason for stopping B-19 vaccination was that distinguishing between post-vaccination and post-infection antibodies was impossible. This complicated the interpretation of serological test results and the identification of affected and non-affected herds. Relying on the vaccination weakened the motivation for and consistency in applying other demanding measures necessary for success.

Materials and methods

Sources of information for this article include the literature, official statistics and documents of agriculture and health

ministries as well as those of the veterinary service administration, publications (12, 13, 14, 15) and the experience of the author (responsible for the preparation and management of the programme). Diagnostic methods adhered to international recommendations (6).

The accelerated eradication methodology was based upon the results of comparative experiments carried out in selected regions by national specialists such as Anderle (2) and Drazan (4). The eradication philosophy and procedure were based upon exploitation of the current replacement ('turnover') policy of older generations of the national cattle population. Priority was given to culling animals from diseased herds to avoid risky breeding of affected animals. This approach also supported the development of a new generation of calves born from brucellosis- and tuberculosis-free parents and the sale of selected, healthy, genetically suitable animals to depopulated ranches.

The eradication (attack) phase

Initially, the traditional 'test and slaughter' method was applied without interrupting the herd breeding process. A ranch could be declared brucellosis-free after three years of observation following elimination of the last positive case discovered during repeated testing of all intrafocal cattle. This method helped to gradually 'clean' affected localities with very low prevalence and without clinical manifestation. However, the method was not always reliable, particularly in outbreaks with higher morbidity, and was found to be too slow considering the deadline for final eradication. New cases were often discovered during the next herd tests and sometimes, even after declaration of the herd as brucellosis-free (recurrence). Isolation measures complicating husbandry and trade were demanding, costly and difficult to sustain over a prolonged period. Continuing exposure of animals and people caused new cases, thus aggravating the situation. Consequently, eradication, particularly in larger ranches with brucellosis abortions, required a more drastic approach.

The decision was therefore made to adopt the accelerated radical method without recurrence (tested previously in a selected region as one of several alternative procedures), based upon affected ranch depopulation after previous interruption of breeding. Artificial insemination and natural mating were stopped one year prior to farm depopulation to avoid new conceptions and slaughter of pregnant animals (the calves were not used for breeding) and to prevent further disease spread. Intrafocal testing was no longer required with this approach. All cattle and other susceptible animals were sent to slaughter on the planned depopulation day(s). Following thorough, final mechanical and chemical disinfection, the ranch was left without cattle for at least six months, assuming that natural devitalisation of *Brucella abortus* would take place in the environment.

Another procedure consisted in introducing negatively tested castrated male or female cattle into the depopulated and disinfected cattle facilities. This was to enable fattening (temporary feedlot), to maintain the production process and provide income to farmers. These animals, serving as biological filters, were again tested before slaughter. New, healthy cattle from brucellosis-free regions were then introduced following final sanitation.

The depopulation policy was applied to gradually expand the brucellosis-free territory to cover the entire country. To facilitate this expansion, a network of selected highly affected farms, i.e. 'isolators', was established, especially in the region of Melnik. The purpose was to temporarily exploit selected, high-yielding pregnant milking cows introduced from other brucellosis farms where all other cattle were sent for slaughter. The numbers of brucellosis isolator farms were as follows: 1961: 33, 1962: 80, 1963: 51 and 1964: 64. These farms were depopulated by the end of 1964.

Complex and demanding eradication procedures required extraordinary professional, organisational, economic and social measures, as well as a temporary adjustment of national trade policy. Specific trade regulations consisted of allocating a temporary meat and milk purchase quota to the national agency in charge of purchasing agriculture products. Brucellosis-free regions reduced cattle slaughter and thus, affected regions were given a chance to increase slaughter as required by the accelerated eradication programme. The national demand for meat was met in this manner. The meat of cattle with clinical symptoms of brucellosis was classified as conditionally comestible after heat-treatment. Brucellosis-free provinces and regions delivered healthy cattle, mainly pregnant heifers, to depopulated ranches to recommence breeding and production. The quota for milk trade was set in the opposite manner, i.e. lower in affected regions because of the reduction in the number of milking cows due to premature slaughter. In the free regions, the quota was increased to maintain national milk trade levels.

The brucellosis eradication campaign covering the entire area of former Czechoslovakia was accompanied by the bovine tuberculosis elimination programme between 1960 and 1968 (32% of affected cows in 1959). The majority of brucellosis-affected ranches were also infected by bovine tuberculosis. The depopulation and repopulation of these ranches helped both programmes. The planned replacement of brucellosis and tuberculosis animals was carried out between 1962 and 1965. This involved the organised transfer of 695,042 healthy cattle from disease-free regions (in 1962: 179,641; in 1963: 179,821; in 1964: 160,067 and in 1965: 175,513 head).

Diagnosis and surveillance

International methods available at that time were used for intravital diagnosis. The tube agglutination test was used as

recommended by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) (6). To increase detection of all affected cattle, the test was combined, in dubious and suspect cases, with a complement fixation test and, eventually, with Coomb's test as modified by Hajdu (9), as well as Kolar's allergic test (11). The agglutination test, with a titre of 1:80 and 1:40 in exposed or suspect animals, was interpreted as positive. To detect and isolate all foci, total populations of cows, heifers and non-castrated bulls were tested every year. Additionally, animals were tested before moving into newly established large-scale units, before being sold for breeding, in quarantine and in the areas under risk identified by thorough epizootiological investigation. Positive animals were visibly marked with a triangular hole in the right auricle (the left auricle was used for similar marking of tuberculosis cattle) and not subjected to repeated testing to avoid problems with potential false negative results. Aborted foetuses, retained placentas, vaginal discharges, milk, etc. were subjected to bacteriological investigations to diagnose new outbreaks and in all suspect cases. Preventive serological testing was carried out in exposed groups of the human population.

Brucellosis surveillance and monitoring was based upon intensive serological testing, as follows (Fig. 2):

– pre-eradication phase (1955-1959): 5,517,733 tests

– eradication (attack) phase (1960-1964): 6,743,901 tests

– initial post-eradication phase (1965-1969): 5,581,964 tests

– follow-up period (1970-1999): 16,199,954 tests.

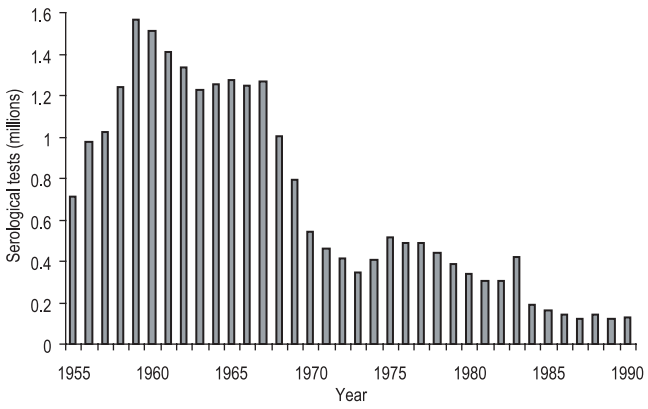

Fig. 2
Cattle brucellosis investigations, Czech Republic, 1955-1990

Altogether, between 1955 and 1999, 34,043,552 tests were carried out, i.e. the annual average was 756,523 tests. A maximal annual test/population ratio of 0.5 was reached in the first year of the attack phase while the average annual value for the 45 evaluated years was 0.25 (Table I).

Table I
Bovine brucellosis surveillance: serological tests in cattle, Czech Republic, 1955-1969

Year	Number of serological tests	Ratio tests/total population
Pre-eradication (preparatory) phase		
1955	713,597	0.2499
1956	974,108	0.3367
1957	1,023,803	0.3601
1958	1,238,204	0.4255
1959	1,568,021	0.5249
Eradication (attack) phase		
1960	1,515,000	0.5000
1961	1,412,843	0.4511
1962	1,333,487	0.4294
1963	1,226,446	0.3949
1964	1,256,125	0.4098
Initial post-eradication phase		
1965	1,276,203	0.4238
1966	1,244,231	0.4101
1967	1,268,323	0.4176
1968	1,003,252	0.3405
1969	789,955	0.2687

Particular attention was paid to clinical and post-mortem suspect cases, newly discovered outbreaks, contact animals and new cases in man. Immediate action was taken to trace the disease source and route of spread using complex diagnostic methods and thorough epizootiological analysis. Every case was different, requiring different approaches. The national reference centre for brucellosis was referred to for a final opinion in dubious cases.

Programme management

Programme management played a very important role, establishing a dense network of well-staffed and equipped veterinary diagnostic laboratories operating according to international standards. Specific antigens, sera and allergens produced by a veterinary biologics factory were tested by the new Institute for Control of Veterinary Biologics. A new Veterinary Sanitation Institute with a network of rendering plants was made responsible for the processing of dead animals and non-consumable animal products, but also for carrying out demanding intrafocal disinfection by specially trained staff provided with modern equipment.

Specific legislation (ministerial decrees), instructions from the Director of the State Veterinary Service and diagnostic standards were issued (12). A national register of all diseased herds was established, and a particular target-oriented information system of reporting was introduced (number of tests, results, diseased animals and herd incidence and prevalence, programme achievement, etc.), together with data processing, evaluation and feedback. Postgraduate training of all the professional staff involved was organised to ensure uniformity in application of

instructions and standards. Intensive extension activities, supported by national mass media, played an important role in the effective implementation of the accelerated eradication programme. The eradication process was stimulated by financial motivation (premiums) and by competitions. The entrances of brucellosis-free ranches were identified with signboards declaring this status.

Streamlining the national brucellosis eradication programme required adapting the organisational structure of the State Veterinary Service (mainly expanding laboratory diagnostic capacities), improving the manpower of the organisation, providing material, logistic and financial backups, and strengthening the vertical management of the structure. For example, a network of regional and provincial epizootiologists was established and placed under the direct technical supervision of the national chief epizootiologist. This resulted in a uniform professional approach, programme preparation, management, co-ordination and evaluation. This structure was linked with a similar network of epidemiologists in the public health service. The veterinary and public health services played a key role in undertaking intensive surveillance with adequate follow-up response. Their collaboration in the field, in laboratories, as well as at managerial level was excellent.

Plans for brucellosis control were elaborated in all affected provinces, regions and ranches, and implemented as an integral part of their production and managerial programmes. Individual plans, respecting national instructions and local conditions, contained the objectives, i.e. final date(s) for depopulation of brucellosis ranches and lists of anti-brucellosis activities with deadlines and responsibilities of personnel. Provincial and regional inter-sectorial committees for zoonoses control co-ordinated the activities of participating organisations.

The eradication programme was supported by direct financial aid to the farmers and co-operatives, mainly to offset the difference between real and slaughter prices. All activities in implementing the programme were financed by the state, i.e. they were free of charge. Insurance agencies contributed as well.

Results and post-eradication period

The main result of the preparatory phase was the identification of specific epizootiological situations and influencing factors, the selection of an appropriate eradication method and the creation of indispensable conditions.

During the eradication phase, 19,247 new brucellosis-positive bovines were detected. All existing 39,835 diseased animals (i.e. 20,841 found at the beginning plus new ones) and more than one hundred thousand intrafocal serologically negative cattle and contacts were eliminated and replaced by healthy animals. Finally, previously vaccinated animals were eliminated to avoid future diagnostic complications. Total eradication comprised 654 initial and 91 new outbreaks, i.e. 745 outbreaks (Table II).

Table II
Brucellosis in cattle: affected regions and outbreaks (new, extinct), Czech Republic, 1960-1969

Year	Number of regions with cattle with brucellosis (on 31 December)	Number of outbreaks of brucellosis			
		Beginning of the year	New	Extinct – eliminated	End of the year
1960	34	654	29	165	518
1961	32	518	17	107	428
1962	22	428	17	61	384
1963	15	384	15	110	289
1964	6	289	10	85	214
1965	0	214 *	3	107	110 *
1966	0	110 *	0	110 *	0
1967	0	0	0	0	0
1968	0	0	0	0	0
1969	0	0	0	0	0

*in observation, i.e. without diseased animals

Zero prevalence in cattle was achieved by the end of 1964 (Table III), followed by zero incidence (Fig. 3). Simultaneous zero incidence was achieved in humans (Fig. 4). Complete recovery of the cattle population was reached by removing and replacing all diseased and suspect intrafocal animals (Table IV). No recurrence appeared during the post-eradication period (14, 15). Eradication was achieved simultaneously in the Slovak Republic, i.e. the entire country of Czechoslovakia was free of bovine brucellosis by 1964.

Eradication cost about US$ 28 million (US$ 15 million: state subsidies, US$ 6 million: services, US$ 4 million: local source expenses and US$ 3 million: insurance agencies). All expenses included, the replacement of one diseased bovine with a healthy animal cost an average of US$ 703 (eradication cost/number of replaced diseased animals) and the eradication of one outbreak cost an average of US$ 37,584. A simple annual benefit/cost ratio of > 1 was reached by the third year of the programme. The cumulative benefit was represented by the specific disease-free status being transferred to following cattle generations, thereby preventing repetition of previous losses. A cumulative benefit/cumulative cost ratio of > 1 was reached by the fourth year of the programme.

Ten years after the eradication of the disease, this indicator reached the value of 5:1, taking into account the cost of post-eradication surveillance. The ratio of cumulative benefits to the

Table III
Prevalence of brucellosis in cattle, Czech Republic, 1955-1969

Year (on 1 January)	Number of diseased animals	Prevalence per 100,000 heads
1955	19,500 *	683 *
1956	22,000 *	760 *
1957	26,186	921
1958	24,000 *	824 *
1959	22,000 *	736 *
1960	20,481	676
1961	33,211	1,060
1962	36,656	1,083
1963	25,288	750
1964	7,998	261
1965	0	0
1966	0	0
1967	0	0
1968	0	0
1969	0	0

* estimates

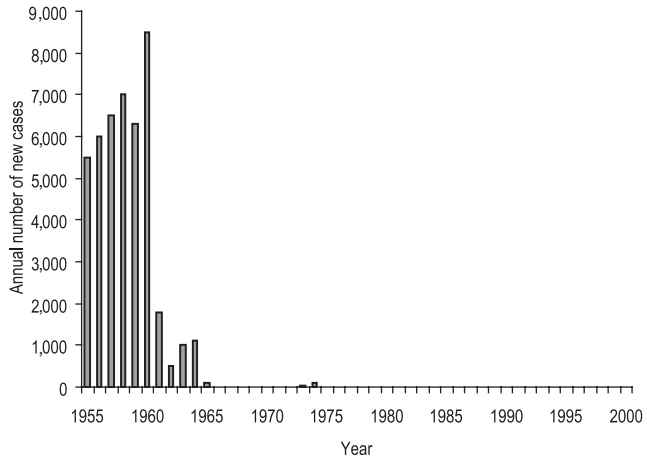

Fig. 3
Brucellosis incidence in cattle, Czech Republic, 1955-2000

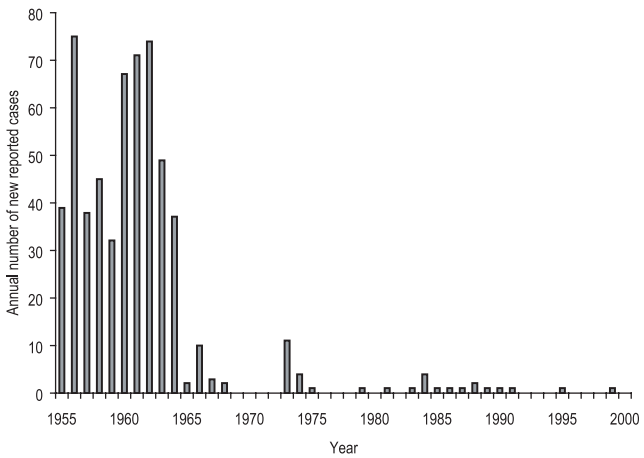

Fig. 4
Brucellosis incidence in man, Czech Republic, 1955-2000

Table IV
Elimination of cattle affected by *Brucella abortus* in former Czechoslovakia, 1960-1964

Year	Number at the beginning of the year	New cases	Eliminated	Number at the end of the year
1960	98,596	9,823	2,186	106,133
1961	106,133	4,279	22,091	88,421
1962	88,421	1,188	20,649	68,960
1963	68,960	1,511	42,184	28,287
1964	28,287	2,631	30,918	0
Total 1960-1964	98,596	19,432	118,028	0

cost of eradication was 7:1 and to the discounted eradication cost, 12:1 (Fig. 5). However, the discount method could not be used on the cumulative public health, biological, ecological and economic benefits which were increasing, i.e. multiplying (not decreasing), in time. The difference between the total cumulative benefit (US$ 236 million) and the total cumulative cost (US$ 43 million) reached a value of US$ 193 million by the tenth year of the programme.

Brucellosis eradication in cattle helps to prevent the occurrence of new cases in the human population (Table V). Monetary criteria are not suitable for evaluating the benefit to human health.

To maintain the success achieved, the post-eradication period was dedicated to a special surveillance system consisting mainly of intensive serological investigation, with priority being given to critical places and strategic timing (Table VI). Following international recommendations (7), the Rose Bengal plate agglutination test was also used for mass preventive investigation from the beginning of the 1990s.

During the post-eradication period, in spite of extraordinary strict protection measures, the disease was introduced twice from abroad. In 1973, affected cattle penetrated from a neighbouring country in one border pasture. The country concerned eliminated the *Brucella*-infected animals in the frontier zone after an official request of the Minister of Agriculture (referring to the current inter-governmental bilateral veterinary agreement). In 1974, brucellosis was reintroduced through the exceptional import of cattle with official guarantee of being from a brucellosis-free ranch based on negative serological tests. All tests carried out after the import as well as the tests after first parturition were negative. However, abortions occurred in the quarantine ranch on second parturition. The outbreaks were immediately eliminated upon detection. Several persons were infected. Foreigners were responsible for a new, exceptional occurrence of the disease in humans. Some cases were caused by *Brucella suis* (eradicated in 1994), while *Brucella melitensis* has never occurred.

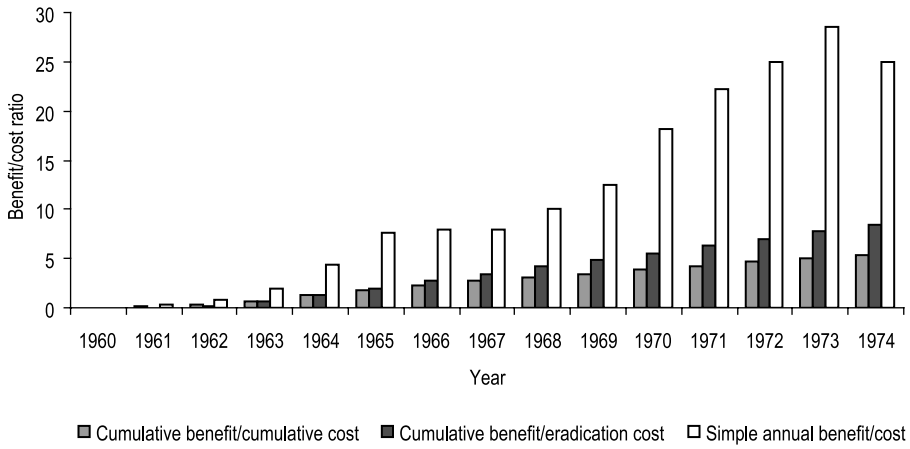

Fig. 5
Bovine brucellosis control: benefit to cost ratio, Czech Republic, 1960-1974

Table V
Incidence of brucellosis in the human population, Czech Republic, 1955-2000

Year	New Cases	Year	New Cases	Year	New Cases
1955	39	1971	0	1987	1
1956	75	1972	0	1988	2
1957	38	1973 *	11	1989	1
1958	45	1974 *	4	1990	1
1959	32	1975	1	1991	1
1960	67	1976	0	1992	0
1961	71	1977	0	1993	0
1962	74	1978	0	1994	0
1963	49	1979	1	1995	1
1964	37	1980	0	1996	0
1965	2	1981	1	1997	0
1966	10	1982	0	1998	0
1967	3	1983	1	1999	1
1968	2	1984	4	2000	0
1969	0	1985	1		
1970	0	1986	1		

The exceptional cases observed during the post-eradication period occurred among foreigners and some were caused by *Brucella suis*
* Cases related to imported cattle infected by *Brucella abortus*

Table VI
Bovine brucellosis post-eradication surveillance: tests in cattle, Czech Republic, 1970-1999

Year	Total serological tests	Positive results	Annual average of tests	Annual ratio tests/total population
1970-1974	2,172,708	111 *	434,542	0.1412
1975-1979	2,314,050	0	462,812	0.1394
1980-1984	1,547,611	0	309,522	0.0877
1985-1989	686,896	0	137,379	0.0395
1990-1994	6,038,143	0	1,207,629	0.4640
1995-1999	3,440,539	0	688,108	0.3952
Total 1970-1999	16,199,954	111 *	539,999	0.1825

* imported cattle

Conclusion

Eradication of bovine brucellosis at national level is not an easy task (8, 16). Approximately half the countries in the world are still reporting the occurrence of the disease (17). Vaccination and 'test and slaughter' control methods continue to prevail in these countries (1, 3, 7, 10, 17). However, the imposition of a relatively short final eradication deadline and the more radical approach described above proved to be useful and effective in the Czech (and Slovak) Republics.

Accelerated eradication in less than one cattle generation consisted of exploiting the reproduction process of the national cattle population with a temporary quota regulating national trade in meat and milk. Discovering and isolating all outbreaks and a consistent system approach were the most important preconditions to the programme.

The active participation of about two thousand veterinarians in the field, slaughterhouses, laboratories, research and service management, as well as the close co-operation of the public health service, were crucial to the success achieved. A centralised State Veterinary Service, strong in manpower, material, facilities and budget proved to be the backbone of this extremely complex and demanding programme. Co-operation with farmer organisations and the support of the public and their representatives were exemplary. Strict measures for very limited imports of cattle, due to increasing self-sufficiency in meat and milk production, helped to protect the country from re-infection.

The drastic method adopted proved to be not only biologically, but also economically effective under the given conditions. The results have been reflected in substantial improvement in the breeding, production and reproductive performances of the cattle population and in ensuring brucellosis-free milk and milk products. The absence of an effective eradication programme would probably have resulted in the disease spreading and the economic losses and number of new diseased humans would be at least the same as at the beginning of the programme. Up to the year 2000, eradication has prevented economic losses of about seven hundred million US$ and saved more than two thousand people from being affected by the zoonosis.

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Une méthode d'éradication rapide de la brucellose en République tchèque

V. Kouba

Résumé

La République tchèque a conçu et introduit une méthode d'éradication rapide de la brucellose bovine, notamment dans les zones d'élevages industriels. Avant sa mise en œuvre, les pertes économiques imputables à la brucellose se chiffraient annuellement à quelque 20 millions de dollars ; par ailleurs, on estimait à plusieurs milliers le nombre de personnes souffrant de la maladie (qui a été diagnostiquée chez 32,4 % des vétérinaires, par exemple). Les premières épreuves sérologiques de masse ont confirmé que la brucellose bovine avait infecté 99 787 animaux, répartis en 654 foyers dispersés sur la moitié du territoire national. Son taux de prévalence était de 676 bovins sur 100 000, pour une incidence de 213. Les recherches systématiques ont permis de dépister la totalité des troupeaux contaminés et de constater l'apparition de 74 nouveaux foyers. Une politique d'abattage sanitaire du troupeau a été mise en place dans les exploitations et les élevages contaminés par la brucellose dans le but d'éradiquer complètement la maladie à une date pré-déterminée. Alors que toute reproduction était provisoirement interrompue dans les élevages infectés, les troupeaux atteints étaient reconstitués par l'apport d'animaux sains provenant de régions indemnes de maladie. Depuis lors, l'incidence de la maladie chez les bovins et l'homme est restée pratiquement nulle. L'éradication a été réalisée en l'espace de cinq ans, sans aucune récurrence. Ce résultat a été obtenu sans réduire la population bovine, le taux de production des bovins ou les revenus des éleveurs. Dix années après l'éradication, le ratio bénéfice cumulé/coût d'éradication était de 7 pour 1. La surveillance mise en place après l'éradication a confirmé le statut de pays indemne de brucellose de la République tchèque. L'éradication de la maladie a entraîné une reprise de la production bovine et des échanges commerciaux. En 2000, l'éradication de cette zoonose avait permis d'éviter des pertes d'environ 700 millions de dollars et la contamination de plus de 2 000 personnes.

Mots-clés

Brucellose bovine – Coût-bénéfice – Dépeuplement – Éradication – Prophylaxie – Surveillance – Zoonose.

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Método de erradicación acelerada de la brucelosis bovina en la República Checa

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Resumen

El autor describe la concepción y aplicación de un método de erradicación acelerada de la brucelosis bovina en la República Checa, y concretamente en zonas donde la producción ganadera se efectúa por lo esencial a gran escala. Antes de la adopción de dicho método, las pérdidas económicas anuales ascendían a unos 20 millones de dólares, y se calculaba que miles de personas padecían brucelosis (el 32,4% de los veterinarios sometidos a prueba, por ejemplo, resultaron positivos). Las pruebas serológicas iniciales revelaron la existencia de 654 brotes, que afectaban a 99.787 animales diseminados por la mitad de las regiones que integran la República. La incidencia se elevaba a 213, con una prevalencia de 676 por 100.000 cabezas de ganado. Gracias a las investigaciones sistemáticas se detectaron todos los rebaños afectados, incluyendo 74 nuevos brotes. En las granjas y haciendas con bovinos infectados se aplicaron medidas de despoblamiento con el objetivo de erradicar por completo la enfermedad antes de un plazo determinado. En las haciendas afectadas se interrumpieron temporalmente las actividades de reproducción, y se sustituyeron los rebaños enfermos por ejemplares sanos procedentes de regiones libres de brucelosis. Desde entonces se ha mantenido a cero la incidencia de la enfermedad en bovinos y seres humanos. En un plazo de cinco años se logró erradicar la brucelosis sin que se produjera rebrote alguno y, lo que es más, sin merma alguna de la cabaña ganadera, la tasa de producción bovina o los ingresos de los granjeros. Diez años después de la erradicación, el índice acumulativo entre beneficios y costos se situaba en 7 a 1. Las posteriores actividades de vigilancia han confirmado que el territorio está libre de la enfermedad. La erradicación de la brucelosis bovina ha redundado en un aumento de la producción y el comercio bovinos. Hasta el año 2000 se habían evitado pérdidas por un valor aproximado de 700 millones de dólares y se había impedido la contaminación de más de 2.000 personas.

Palabras clave

Brucelosis bovina – Control de enfermedades – Despoblamiento – Erradicación – Índice beneficios/costos – Vigilancia – Zoonosis.

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