

**THE OUTBREAK  
OF FOOT - AND - MOUTH DISEASE  
(ASIA 1 TYPE)  
IN 1973 IN IRAN(\*)**

**BY**

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**INTRODUCTION**

Foot-and-Mouth Disease (Asia 1 type) is not endemic in Iran but is introduced into it from the countries (territories) on the Eastern border where it is enzootic. The presence of Foot-and-Mouth Disease virus Asia 1 type in Iran had not been reported until late in 1957 when it was first isolated and identified in infected herds of animals around Razi Institute. The outbreak was not so much severe and was successfully stamped out in a short time. The next epizootic occurred in 1964 in flocks of sheep only around Meshed (East Province) and the virus was identified by Razi Institute. This outbreak, too, was checked in a period of less than four months.

The latest outbreak occurred among cattle farms around Tehran early in May, 1973 and the virus was identified as Asia 1 type. The severity of this outbreak was due to high susceptibility of the cattle and the pathogenicity of the strain. The disease spread very rapidly over the entire country within less than two months, causing heavy losses along the way.

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## SOURCE OF INFECTION

Immediately upon isolation and identification of the type, the staff of Foot-and-Mouth Disease Section of Razi Institute visited the infected areas and observed that the source of infection came from a number of cattle which had been brought from places where infected herds had been smuggled into the country. The diseased animals had escaped the strictly quarantined regions and thus had carried the infection into the country.

A serological test, according to Komer's method (CFT as 100 percent haemolysis) was done on the samples collected from Sistan and Baloochestan (South East Provinces) and only Asia 1 type was identified. The test confirmed that the infected herds had been first smuggled in Sistan and Baloochestan and later transported to the Central, Kerman, and Khorassan Provinces, respectively.

## EPIZOOTIOLOGY

Foot-and-Mouth Disease virus Asia 1 type was first isolated and identified during the latest outbreak which occurred on 13th of May, 1973 in cattle farms around Tehran.

The severity of infection was so much high that it contaminated eighty to a hundred percent of the cattle population in the infected regions. As table I indicates, it spread within approximately 9 days in 13 provinces and swept out the major parts of the country in less than two months.

Factors which helped the infection spread at a more speedy rate might be given as follows:

*a) Tehran Slaughterhouse.*

This is a central place where some of the animals brought from almost all parts of the country, are sold on the spot and later transported to other cities. The purchased animals may be the very carriers of infection that travel all over the country.

*b) Persons who may be going from infected into uninfected cattle farms.*

*c) Climatic conditions of the surrounding areas of Tehran and especially the strong winds, which may carry the causative agent to uninfected regions and due to geographic situation and density of the cattle farms around Tehran winds played a significant role in the spread of the disease.*

*d) Cheap marketing of the diseased animals in Eastern neighbouring*

countries and high price of meat in Iran, were some of the reasons for a wider spreading of the infection throughout the country.

Samples of tongue epithelium, claws, teats, udders, and hearts of the suspected animals were taken to Foot-and-Mouth Disease Section of Razi institute from different Provinces of Iran. The Type of virus was identified according to Kolmer's method and in cases where the type was not identified directly, cell passaging was employed and upon observing cytopathogenic effect (CPE) the test was resumed and the typing was completed.

The number of Asia 1 type isolated from Central Province was larger than that from other provinces. The increase was due to the geographical density of the cattle farms around Tehran. Khorassan and Gilan Provinces rated next to Tehran, and because few samples were received from some parts of the country such as Illam and Chahar-Mahal-Bakhtyary, no Asia 1 type was identified.

Fig. 1 and Table II show the servery of infection as caused by Asia 1 type in comparison with the cases caused by A and O types during different months. As it will be seen from these tables, the latest Foot-and-Mouth Disease virus Asia 1 type broke out late in May 1973 and The infection reached the peak by the end of May and early in June, spreading almost all over the country during the very short interval. Though the outbreak was brought under control by mass vaccination and enforcement of animal health preventive measures and the infection diminished, still it caused heavy losses.

#### SYMPTOMS AND THE SUSCEPTIBLE ANIMALS

The general characteristics of the Foot-and-Mouth Disease infection were discovered in animals affected with Asia 1 type of the disease during the latest outbreak. Typical vesicles of Foot-and-Mouth Disease infection caused by Asia 1 type were observed, especially on all parts of the teats and udders of eighty percent of the diseased cattle. However, the important consideration about the latest epizootic of Foot-and-Mouth Disease was that, it occurred and spread among cattle more speedily than the 1964 outbreak which affected flocks of sheep. As table III shows the number of mortality cases in cattle was larger than those given for sheep and goats in different months.

#### DISCUSSION

As already stated, Foot-and-Mouth Disease virus Asia 1 type is not endemic in Iran but is frequently introduced into the country through importations of infected herds and flocks of animals from the countries on the Eastern border.

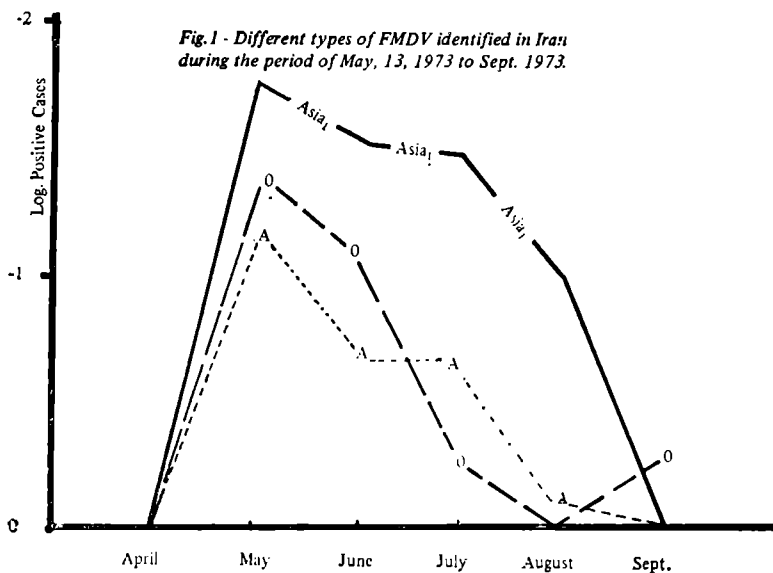


TABLE I

*Isolation and Identification of Foot-and-Mouth Disease Virus Asia 1 type in Iran in 1973*

N°	Province	First Identification
1	Central (Tehran)	May 13, 1973
2	Gilan	May 15, 1973
3	Lorestan	May 16, 1973
4	Kerman	May 17, 1973
5	Isfahan	May 17, 1973
6	Mazandaran	May 17, 1973
7	Sistan and Baloochestan	May 17, 1973
8	Khorassan	May 17, 1973
9	Kermanchahan	May 19, 1973
10	Eastern Azarbyjan	May 20, 1973
11	Fars	May 22, 1973
12	Zanjan	May 22, 1973
13	Gorgan	May 22, 1973
14	Hamadan	June 2, 1973
15	Sahely	June 3, 1973
16	Western Azarbyjan	June 5, 1973
17	Khoozestan	June 25, 1973
18	Yazd	June 30, 1973

TABLE II  
*Isolation and identification of Foot-and-Mouth Disease Virus  
from samples received from May 13, 1973 to Sept. 73*

Month	Focus	A +	O +	Asia 1	Negative
May . . . . .	351	23	40	7 <sup>2</sup>	213
June . . . . .	245	7	10	57	165
July . . . . .	82	7	3	48	24
August . . . . .	20	1	—	11	8
Sept. . . . .	11	—	3	—	8

TABLE III  
*Mortality caused by Foot-and-Mouth Disease virus Asia 1 type  
in cattle, sheep and goats in different months.*

Month	Cattle	Sheep	Goats
May . . . . .	977	25	4
June . . . . .	42	34	—
July . . . . .	17	57	—
August . . . . .	25	11	—
Sept. . . . .	2	—	—

Methods and means of spread were uncontrolled traffic of vehicles and persons going from infected to uninfected areas, Tehran slaughterhouse where the diseased animals often enter and are later transported to other parts of the country, selling the animals in incubation period at low prices in an effort to avoid further losses, and lastly, climatic conditions especially strong winds which may have carried the Foot-and-Mouth Disease virus particles far distances away before UV sunlight had enough time to kill them on the way. As a result, winds had a significant part in the spread of infection due to the density of farms around Tehran. Other possible factors of the spread of the disease were rains which, if heavy and lasting downpour, will wash down all the virus into ground, and calm weathers in which virus particles surrounded by mucus or attached to dust may descend by their own weight. Spread by wild life such as foxes, rats and some birds were also considered as possibilities.

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## SUMMARY

1. The 1973 epizootic of Foot-and-Mouth Disease virus Asia 1 type broke out in the cattle farms around Tehran on the 13th of May and spread throughout the country in less than two months. The source of infection was detected among herds of cattle smuggled from the countries on the Eastern border of Iran.

2. The factors of spread of disease were vehicles and persons, cheap selling of the diseased animals and the Tehran slaughterhouse which acted as a source of infection.

3. The infection in cattle was more severe than in sheep, goats and hogs.

4. Foot-and-Mouth Disease virus Asia 1 type infection on teats and udders of the cattle affected during the latest outbreak was more severe than ever before.

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Various Figures for FMD Lesions Caused by Asia 1 type are provided as follows:



Figure 1.  
Apparition of a vesicle on the teat of a cow



Figure 2.  
Lesions on the teats of a cow.



Figure 3.  
Advanced lesions on the teats of a cow



Figure 4.  
Lesions on the gingiva of a cow.





Figure 5.  
Lesion on the claw of a cow.

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