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	ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE	
	ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACION	March 1975

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

Twenty-First Session

Rome, Italy, 8-11 April 1975

COST-BENEFIT ANALYSIS IN

THE FEDERAL REPUBLIC OF GERMANY

RECEIVED

- 8 APR 1975

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As reported previously vaccination of cattle against FMD is compulsory in the Federal Republic of Germany since the end of 1966. This policy was introduced under the Second Regulation concerning foot-and-mouth disease, of 12 December 1966. Since then FMD has virtually disappeared. The considerable cost of implementing vaccination, borne partly by the Länder Governments of the Federal Republic, and partly by stock owners, have repeatedly caused requests that the Federal Government reconsider the requirement of compulsory vaccination. The cost-benefit analysis, however, has shown that the Government vaccination policy is of great benefit to the interested parties. It can be anticipated that the benefit will still be increasing during the coming years. Apart from the fact that the lifting of the regulation of vaccination is to be rejected also for other reasons, the cost-benefit analysis is in favour of its maintaining.

The executing agency (a firm for market research, planning and consultation; cost of analysis DM. 53,000 and duration of analysis 6 months) compared the period 1960 to 1966 (before the introduction of compulsory vaccination) with the period 1968 to 1973 (after the introduction of vaccination), and extrapolated forecasts up to 1983. Thereby the costs (vaccine, vaccination fees, and vaccination damages) were compared with the benefits. The benefit is loss avoided through vaccination. The analysis is based on the assumption that in the case of not introducing compulsory vaccination at the end of 1966, or discontinuing vaccination at some time in the course of the years, there would have been losses as prior to 1967. In qualifying the avoided losses, developments of herd size and prices were taken into consideration, in accordance with usual methods.


The cost for carrying out vaccination are considerable; they amounted, as an average, during the period 1968-1973 for the stock owners to about 21.4 million DM. and for the Länder Governments to about 16.9 million DM., all together to about 38.3 million DM. Part of the expenditure would have been made also without compulsory vaccination. If this amount is deducted, there still remains, for the purposes of cost-benefit analysis a total of 20.6 million DM. (11.5 million DM. cost borne by livestock owners and 9.1 million DM. borne by the Länder Governments).

The benefit resulting from compulsory vaccination (avoided costs) was found to be 17.1 million DM. per year for livestock owners and 10.5 million DM. for the Länder Governments (total 27.6 million DM.).

The balance amounts to a net benefit of 5.6 million DM. annually for the stock owners and 1.5 million DM. for the Länder Governments, during the years 1968 to 1973, resulting from compulsory vaccination.

For the period 1974-1983 the net benefit increases to 6.75 million per year for the stock owners and 6.96 million for the Länder Governments. The benefit increase is mainly due to the considerable increase in avoided costs (mainly because of increased evaluation). The share of the Länder Governments in the total benefit of compulsory vaccination will increase from the present 20 percent to about 50 percent in future years.

Besides the quantifiable benefit, there are also additional benefits resulting from avoided losses in other sections of the national economy. These, however, can not be calculated in most instances. Anyway, the loss in animal export and trade due for FMD was estimated at an amount of at least 20 million DM., only in the year 1966.

	FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS	AGA: EUFMD/75/1 November 1974
	ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE	
	ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACION	

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

Twentyfirst Session

Rome, Italy, 8-11 April 1975

PROVISIONAL AGENDA

1. Adoption of Agenda
2. Position of foot-and-mouth disease and swine vesicular disease in Europe and other countries of interest
3. Campaigns in southeastern Europe
4. Report of the Executive Committee on the activities of the Commission and the Secretariat
5. Approval of accounts and budgets
6. Election of the Executive Committee:
 - (a) election of Chairman
 - (b) election of Vice-Chairman
 - (c) election of members
7. Approval of draft report of the session
8. Any other business.



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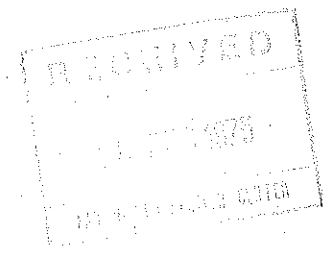
EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

Twenty-First Session

Rome, Italy, 8-11 April 1975

A. POSITION AND CONTROL OF FOOT-AND-MOUTH DISEASE DURING THE
LAST BIENNIUM 1973-1974

(Introductory Note by the Secretary)



I. EUROPE

1. Disease position

Statistics on the occurrence of FMD in Europe, the Near East and Northern Africa are reproduced in Table I (1973) and Table II (1974). Reports of the situation, especially concerning 1973, were distributed at meetings of the Executive Committee held in Mantua (October 1973) and Rome (April 1974) and of the OIE annual sessions in 1973 and 1974. Nevertheless some comments appear to be appropriate at this stage, especially with regard to the events of 1974.

1973

At the Twentieth Session of the European Commission (April 1973), the continent was still faced with a delicate situation created by the spread of an epizootic in 1972 which had involved six countries in central-eastern Europe.

Initially, the outbreaks had been caused by virus C, but subsequently O virus took over, especially in Czechoslovakia and Austria. The latter country suffered considerable damage in dealing with 1,650 foci between January and August 1973. Some 10 million dollars were spent in indemnities alone. During the spring and summer of that year the danger of the disease spreading toward western countries persisted. It should be acknowledged that the measures taken in Austria to isolate the infected areas and protect other countries by the extensive use of vaccination were extremely efficient. Exports continued from unaffected regions of some countries involved in the outbreak, with no adverse consequences at destination.

In Spain outbreaks continued to occur in 1973. From a peak of 236 foci in March there was a significant reduction during the succeeding months, with only 5 outbreaks recorded between August and December. This situation reflects the success of mass vaccination campaigns carried out in the spring of 1973 with trivalent vaccine, incorporating A Santander, the virus strain which had been introduced into the North of the country during the previous year.

Italy. Only 13 foci were reported during the year despite massive importation and trade in animals, meat and animal products.

Greece was affected by the return of A₂₂, though limited to a few foci in only two provinces and by a true epizootic caused by a new type O strain (see later) which persisted throughout the year. The extensive use of homologous vaccine made it possible to bring the disease under control late in the autumn.

The Federal Republic of Germany succeeded in eliminating the occurrence of sporadic foci of infection which in the previous year had been attributed to failure in vaccine inactivation. The implementation of new regulations regarding official testing of vaccines proved satisfactory.

Turkey. Important changes occurred in Turkey with the appearance of outbreaks caused by Asia 1 virus (see under campaigns), but fortunately the disease did not spread further west than the Bosphorus area.

1974

In France, an epizootic wave caused by virus C started spreading in February among the pig population of Brittany, rapidly involving three provinces of that region. The peak of the epizootic was reached in March with 65 outbreaks recorded, but fortunately the disease was already under control in April. In May the last four foci were reported. For the first time in this country, strict measures were enforced on the movement of persons: schools were closed, sport activities and gatherings, including religious services, were suspended. A most important element, however, for the success of the control operation, was the progress achieved in the preparation of potent vaccines for pigs. By the extensive application of oil vaccines within and around infected areas it proved possible to confine the infection within the affected region.

Channel Islands. The detection of an outbreak in the island of Jersey, at a time when no other outbreak existed except in Spain and the Pyrenees, was a further demonstration of the persisting vulnerability of Europe. The outbreak was promptly stamped out.

Belgium suffered an outbreak in April. Prompt action in detecting the origin of the infection, probably caused by mechanical failures in vaccine inactivation, and the identification of all vaccinated animals as well as those exposed to potential contamination served to limit secondary outbreaks to a minimum. It took a month, however, for the situation to return to normal.

In Austria a few sporadic cases occurred in March in the same area affected by the disease in 1973. The origin of the disease seemed to be attributable to frozen meat which had been kept in storage on a farm for the past year. The dramatic experience of 1973 induced the Government to pass an amendment to the Federal Law concerning infectious diseases. Stamping-out can now also be enforced in exposed non-infected farms. This measure was implemented successfully for the first time on the occasion of the above-mentioned outbreaks at Altlichtenwart (Lower Austria).

In Italy, the situation had further improved with only 5 outbreaks recorded during the year, 3 in February and 2 in December. It should be noted that in both instances the origin of infection had connection with imported animals and that the disease appeared almost simultaneously in the North and the South of the country.

In the Federal Republic of Germany, a focus of infection occurred, not far from a vaccine production unit. In this case also, it took one month to bring the situation back to normal without further consequences, especially for the large pig population of the affected region. Since the new regulations concerning innocuity and potency testing of FMD (the complete text of the regulations is given in Appendix Va of the Report of the Research Group, Lelystad, October 1974) came into force, there has been no evidence or suspicion of the disease being attributable to residual infectivity in the vaccines.

There was a deterioration in the disease position of Spain as a result of the spreading of C virus infection among the pig population in the northeastern provinces of the country.

Towards the end of the year outbreaks caused by an unusual O₁ strain (see next section of this paper) occurred in close succession in Belgium, the Netherlands and, as mentioned above, northern and southern Italy. Both cattle and pigs were affected. The disease continued to appear sporadically in Belgium and Italy in January 1975. These foci of infection, though limited in number, were nevertheless widely distributed on the continent; and much more serious consequences could certainly have been experienced if the disease had spread as in the previous biennium among an unprotected animal population.

2. Virus types and subtypes

There has been no major change in the subtype position on the continent concerning strains of A, O and C virus isolated during the biennium. Neither the Asia 1 virus nor A₂₂ were recovered in Turkish Thrace. The last A₂₂ foci occurred in Greek Thrace in January 1973.

Investigations on the virus specimens received from Europe and Anatolia were carried out by the W.R.L.; all findings (including those regarding an O strain from the Philippines) are summarized in Information Sheets Nos. 18-24 attached to this report.

Studies on A Santander (Spain 1972, 1973) were continued in France and both Laboratories, IFFA and Roger Bellon confirmed the serological and immunological differences which in 1972 had been found to exist between A Santander and other European and South American A strains. A Santander appeared to be very close to A₂₆ (Argentina). It was also found that two vaccinations with A₅ vaccine conferred a satisfactory protection against A Santander in cattle.

A noteworthy immunological difference was also found to exist between O Peplos (an O strain which had occurred in Greece during 1972 and 1973) and O₁ Holland in studies carried out at the FMD Institute at Aghia Paraskevi, Athens.

O₁ virus appeared in Belgium in November 1974. Although belonging to the O₁ group, it showed a difference in density (1.43) compared with the O₁ virus used in vaccine production. Serological investigations including double immunodiffusion tests failed at the W.R.L. to reveal differences between the new strain and the vaccine strain O₁ Bruges.

3. Ordinary prophylactic campaigns and progress in vaccine production

The programmes described in previous Commission reports concerning systematic mass vaccinations in the Netherlands, Belgium, France, the Federal Republic of Germany and Spain were again implemented during the biennium under review. In addition programmes of frontier areas and ring vaccination around FMD laboratories, abattoirs etc. were carried out more extensively than before in Yugoslavia, Austria, Czechoslovakia, Hungary and Romania. Extensive vaccination programmes were applied in the USSR. Buffer zones were maintained in southeastern Europe (see under campaigns). Table III shows the position of European vaccination programmes, including the cost of vaccines.

Progress in the preparation of vaccines both for cattle and pigs was reported in specialized meetings and those of the Research Group. The purification of the antigen is becoming a general procedure to further reduce allergic reaction in vaccinated animals. So far results have been very encouraging. Further progress regarding antigen purification, based on new techniques, has recently been announced by French vaccine manufacturers.

Vaccines for pigs have also been applied with success. So far Spain is the only country where pigs have regularly been vaccinated with oil, dextran or concentrated cattle vaccines. 1.5 million doses of oil vaccine have been used with very good results to control F.M.D. in Brittany (France). Prophylactic vaccination of all breeding stock can be considered to protect regions with a high concentration of pigs exposed to infection.

Conditions of safety measures were improved in several European institutes to further reduce the risk of virus escapes. This subject together with problems of immunity and potency testing and vaccine standardization was dealt with at the meeting held by the Research Group at Lelystad (details are given in section III of the Report of the Commission's Activities).

II. NEAR EAST

1973

The most significant change consisted in the appearance of Asia 1 virus in Iran during spring 1973. 1.8 million cattle and 7.7 million sheep and goats were vaccinated either with monovalent (Asia 1) or polyvalent (Asia 1, A, O) vaccines against FMD during the year.

Iranian workers have drawn attention to the consequence of Asia 1 infection in cattle, especially in dairy animals, such as a sharp drop in milk production, mastitis, extended foot lesions and "sequelae" of heart involvement (myocarditis). A high mortality was noted in lambs, and "tiger heart" was found at autopsy. Similar observations were made in Afghanistan. In no other country of the region, with the exception of Turkey, was Asia 1 virus isolated during the year.

From field specimens submitted to the WRL, the results of virus typing were the following: O virus in Iraq (2 specimens) and India (24 specimens); A type in Lebanon, O type (5 specimens) in Kuwait; O type (7 specimens) and A type in Saudi Arabia, A type (1 specimen) in Syria.

1974

The Asia 1 virus was reported only from Lebanon (7 positive specimens in June), but there are reasons to believe that this was not the only country infected in the region.

From typing carried out at Teheran and specimens submitted to W.R.L. it appeared that O virus was more widely spread (Iran, Lebanon, Jordan, Saudi Arabia, Yemen) than A type which was found only in Iran, Jordan (once) and Kuwait.

Except for Iran, where systematic vaccination is being applied more and more extensively in various provinces, prophylactic action remains limited to improved breeds of cattle in the other countries.

Indiscriminate importation of live animals continues to take place into some countries. This explains the continuously changing pattern of type distribution in the region. The risks of new epizootics, including Asia 1, eventually reaching Europe, can only be reduced by improving animal health and disease control at the origin of major international animal movements, particularly in eastern Africa. Northern Africa would certainly benefit from such improvements, as they are exposed to much the same dangers. Fortunately, no exotic type of virus has been isolated so far in northern Africa but the traffic directed toward the North of the continent is certainly a potential danger.

Systematic mass vaccination is only carried out in Israel and, though limited to certain regions, also in Iran. In the other countries of the Near East region and northern Africa there is an increasing interest in prophylactic activities. Iraq and Lebanon have carried out important programmes, especially in 1974.

In the Arab Republic of Egypt a consistent amount (400,000 doses) of vaccine has been produced for the first time and a regular vaccination programme, though limited to governmental farms, has been initiated.

III. SOUTH AMERICA

The pattern of the disease position in the South American countries which are particularly important in international trade has not markedly changed. In the Argentine there was a decrease in disease incidence, especially during 1974.

The views expressed at the last Session of the Commission concerning the need for a controlled application of vaccines in the field, are still valid. Progress has undoubtedly been made in enforcing the official testing of vaccines, especially in the Argentine. Whereas a disease-free zone has successfully been maintained in Patagonia, consideration has been given to the possibility of starting similar operations in other countries. Colombia is one of the countries where the establishment of disease-free zones would have immediate beneficial repercussions in connection with the opening of the Pan American highway.

The restrictions imposed by the EEC countries on imports of meat have only reduced the risks of introducing viruses from that continent, should the precautions recommended by the Commission not receive due consideration.

It therefore remains advisable to follow the evolution of the subtype distribution on this continent. In the Argentine alone, 2349 samples are submitted to the laboratories for typing in 1973, which indicates active diagnostic work in the field. The Pan American FMD Center in Rio de Janeiro, publishes the subtype position in South America every three months.

During 1973 and 1974 the subtype position in some selected South American countries was:

	<u>1973</u>				<u>1974</u>			
Argentina	O ₁	A ₂₄	A ₂₆	C ₅	O ₁	A ₂₄	A ₂₆	C ₅
Uruguay	O ₁	A ₂₄	C ₂	C ₃	A ₂₄			
Paraguay	O ₁	A ₂₄	C ₂	C ₃	O ₁	A ₂₄	C ₃	
Brazil	O ₁	A ₂₄	C ₃		O ₁	A ₂₄	C ₃	
Colombia	O ₁	A ₂₇	A ₃₂		O ₁	A ₂₇		
Venezuela	O ₁	A ₂₇	A ₃₂		O ₁	A ₂₇	A ₃₂	

10/1/74

B. POSITION AND CONTROL OF SWINE VESICULAR DISEASE IN 1973 AND 1974

Swine vesicular disease continues to be recorded in Europe and Asia. According to disease reporting data, the most affected countries in 1973 and 1974 were the United Kingdom followed by Italy. Outbreaks were recorded in the United Kingdom since December 1972 and reached 300 at the end of 1974. All these outbreaks were dealt with by the stamping-out policy. The slaughter policy was also applied on the occasion of the few outbreaks which occurred in the Federal Republic of Germany and in Switzerland.

Sporadic outbreaks also occurred in Austria. The disease is known to exist in France and Belgium.

In Eastern Europe there has been no additional report of the disease after the outbreak which occurred in Poland in December 1972.

Outside Europe swine vesicular disease has been reported from Hong Kong in several instances and once from Japan.

As from Circular No. 330 of June 1974, OIE gives the reported outbreaks of swine vesicular disease every month.

The report of the Twentieth Session of the European Commission as well as those of the meetings of the Executive Committee in Mantua (October 1973), Rome (April 1974), Berne (February 1975) and the Report of the Director of OIE at the XLII Session of the Office (May 1974) contain ample information on the epizootiology and control of swine vesicular disease in Europe. In particular, the U.K. Veterinary Services and the Animal Virus Research Institute, Pirbright have contributed greatly to establish diagnostic procedures and to clarify ways and means which account for the transmission of the virus, virus persistence, and resistance to disinfecting agents.

The significance of animal products, swill, animal movements, markets, vehicles, and wind in the transmission of the disease was carefully studied and conclusions were drawn as to the most appropriate way of disease control and prevention. Having found that the virus is resistant to disinfectants unless they have a pH range below 2.6 or above 12, useful instructions as to the most efficient disinfectant and their formulation and association with reagents were recommended. Also of great importance for disease control and intelligence were the findings of virus persistence and recovery in the intestinal tract of pigs which had an attack of the disease (Brescia). The first experiments of vaccination against the disease have been carried out with success.

Much remains to be clarified as to the actual distribution of the disease both in Europe and in Asia, and the preventive control measures which could or should be taken in addition or modification to those already recommended, in the light of the experience gained in dealing with the disease.

TABLE I
 Outbreaks of foot-and-mouth disease and virus types recorded in Europe, the Near East and Northern Africa during 1973
 (Dates in brackets relate to the last outbreak recorded)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
<u>EUROPE</u>												
Iceland never had FMD												
Norway (1952) Sweden (1966)												
Finland (1959) Ireland (1941)												
Denmark (1970)												
U.K. Great Britain (1968)												
U.K. North. Ireland (1941)												
Belgium (August 1971)												
Netherlands (January 1972)												
Luxembourg (1963)												
France	1											
Fed. Rep. of Germany	2	2	3	2								
	C	C	A	A	C							
Italy		2							1	6	4	
		A							C	0	0	
Switzerland												
			1									
			0									
Austria	9	13	9	165	970	406	76	2		1		
	C	C	0	0	0	0	0	0		0		
Czechoslovakia	5	6	2	3	1							
	0	0	0	0	0							
Portugal (1971)												

Notes: A blank indicates no outbreak

Subtypes: 0 = 0₁

Table I (contd.) 1973

EUROPE	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Spain	12 0 C	134 A C	236 A C	40 A C	15 0	5 A	6	2	2			1 C
Germ. Democrat. Rep.												
Poland (1971)												
Yugoslavia	2 0	6 0 C										
Hungary (Nov. 1972)												
Romania	2 0											
Bulgaria	3 A	1 A										
Albania (1959)												
Greece	2 0	2 0	2 0			7 A*	46 0*	19 0* A*	157 0*	112 0*	13 0*	
Cyprus (1964)												
Malta (1946)												
Turkey (1)	45 0 A*	20 0 A*	39 0 A*	102 0 A*	203 0 A*	293 0 A*	138 0 A*	130 0 A*	78 0 A*	26 0 A*	27 0 A*	17 0 A*
U.S.S.R. (2)	95 0 A*	92 0 A*	75 0 A*	81 0 A*	46 0 A*	55 0 A*	65 0 A*	56 0 A*	54 0 A*	37 0 A*	24 0 A*	22 0 A*

Notes: A blank indicates no outbreak
 Subtypes: A* = A22 (group) O* = 0 Greece Asia = Asia1
 (1) Turkey: The large majority (138) of outbreaks reported in August and September were caused by virus Asia1.
 (2) U.S.S.R.: Soviet Republics of Lithuania, Lettonia and Estonia are disease free since 1966.

Table I (cont'd) 1973

NEAR EAST	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Jordan				1	2	2						
Lebanon	6	16	7 A	10 0	29 0	9	11	4	9	3	2	3
Syria						+					A virus	2
Iraq	3	11	13	21	31	46	46	34	22	22	16	12
Iran	14 0	28 0	23 0	106 0	351 0	254 0	41 Asia	4 Asia	11 0	8 0	11 0	13 0
Israel	-	-	-	-	-	-	-	1 0	-	-	-	-
NORTHERN AFRICA												
Arab Republic of Egypt	2 0	3 0	3 0	1	-	-	2	-	1	-	-	2
Lybia												
Tunisia	-	1	2	2	-	1	-	-	-	-	-	-
Algeria												

Notes: A blank indicates no information received A dash indicates no outbreak
Types and Subtypes: Asia 1 found in Iran only.-
The W.R.L. identified FMD on samples received from:
Iraq (O); Jordan (O); Lebanon (O and A);
Kuwait (O and A); Syria (A); Saudi Arabia (O and A)
A virus: likely to belong to the A22 group.

TABLE II

Outbreaks of foot-and-mouth disease and virus types recorded in Europe, the Near East and Northern Africa during 1974
 (Dates in brackets relate to the last outbreak recorded)

EUROPE	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Iceland never had FMD												
Norway (1952) Sweden (1966) Finland (1959) Ireland (1941)												
Denmark (1970)												
Great Britain (1968) U.K. North. Ireland (1941)												
Belgium (August 1971)				44 0	6 0						6 0	2 0
Netherlands												2 0
Luxembourg (1963)												
France	1 0	5 0	65 0	14 0	4 0							
Fed. Republic of Germany									4 0	10 0		
Italy		3 0										2 0
Switzerland (March 1973)												
Austria			7 0									
Spain	16 0	56 0	58 0	44 0	7	3			1 0	7 0	22 0	16 0
Portugal (1971)												

See notes overleaf. * incomplete information

Table II (cont'd) 1974

EUROPE (cont'd)	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Czechoslovakia (December 1973)												
German Democratic Republic												
Poland (1971)												
Yugoslavia									4 C			
Hungary (November 1972)												
Romania (January 1973)												
Bulgaria (February 1973)												
Albania (1959)												
Malta (1946)												
Cyprus (1964)												
Greece	12 0 A*											
Turkey (1)	14 0 A*	14 0 A*	13 0 A*	29 0 A*	31 0 A*	66 0 A*	56 0 A*	54 0 A*	67 0 A*	50 0 A*	? 0 A*	? 0 A*
U.S.S.R. (2)	27 0 A*	18 0 A*	7 0 A*	8 0 A*	20 0 A*	17 0 A*	11 0 A*	7 0 A*	9 0 A*	31 0 A*	? 0 A*	? 0 A*

Notes: A blank indicates no outbreak Subtype: A* = A₂₂ (group)

- (1) Turkey: last Asia 1 outbreak was reported in September 1973
- (2) U.S.S.R.: The Soviet Republics of Lithuania, Lettonia and Estonia have been disease-free since 1966; Ukraine's last reported A₂₂ outbreak was in April 1973; Bielorussia had one A₂₂ outbreak in June 1974.

Table II (cont'd) 1974

NEAR EAST	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Jordan				+		+				2		
Lebanon	9	9	10	A		0	5		10	27	13	
Syria							Asia	0	0	0		
Iraq	8	5	4	2	3	8	9	30		9	5	
Iran	19	10	35	29	14	19	9	9	3	8	9	14
	0	0	0	0	0	0	0	0	0	0	0	0
Israel	-	-	-	-	-	-	-	-	-	-	-	-
NORTHERN AFRICA												
Arab Republic of Egypt		2	3	1	3	6	2	4	1	4	2	1
		0	0	0	0	0	0	0	0	0	0	0
Lybia												
Tunisia	-	-	-	-	-	-	-	-	-	-	-	-
Algeria												

Notes: A blank indicates no information received

A* = A22-group

Types and subtypes:

A dash indicates no outbreak

Asia 1 found in Lebanon only.
 The W.R.L. carried out typing on samples from the following countries: Jordan (A and O); Lebanon (O and Asia 1); Kuwait (A), Yemen(O); Saudi Arabia (A).
 Typing is carried out locally in Israel, Iran and Egypt.

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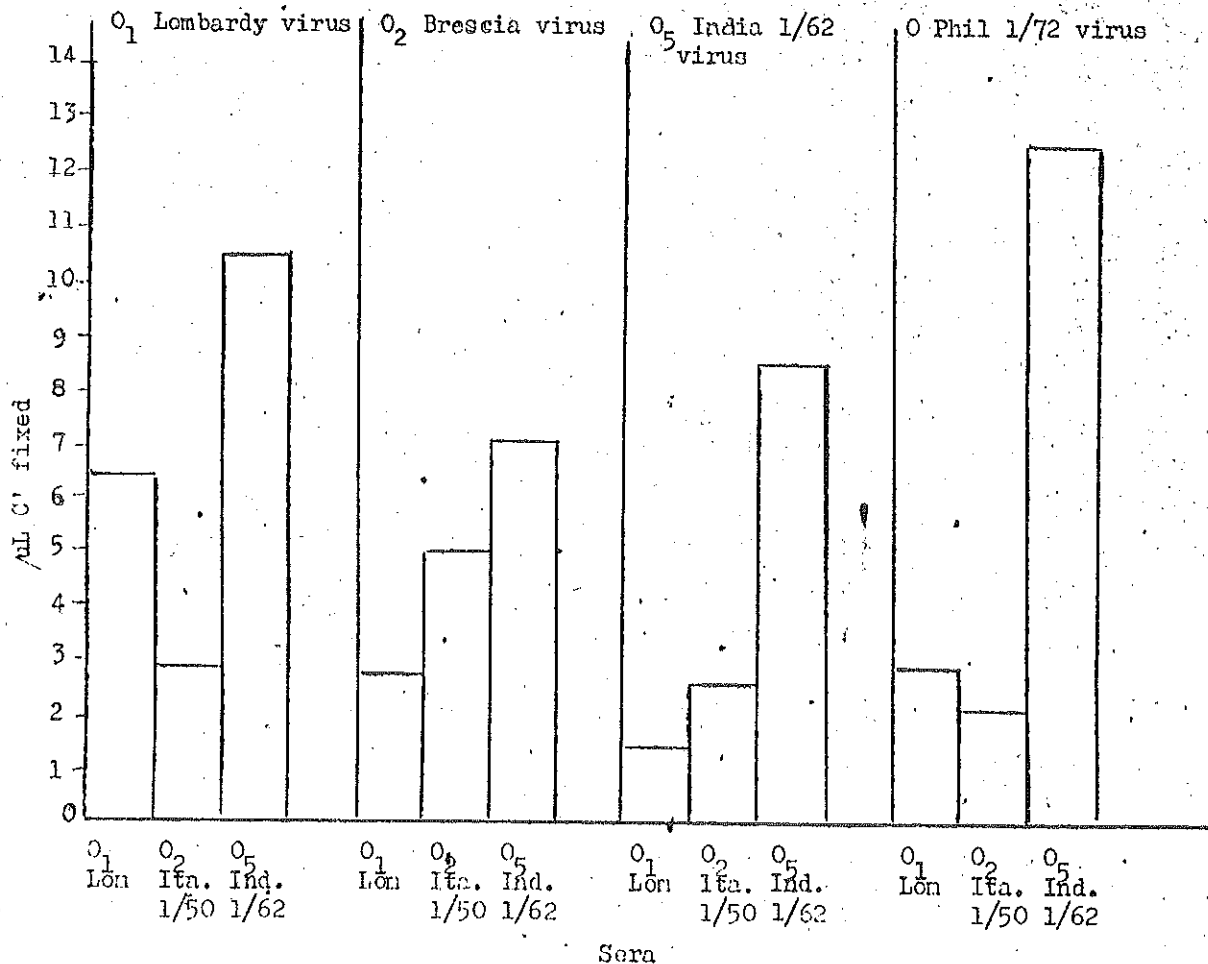
W.R.L. INFORMATION SHEET NO. 18

DATA ON FMD TYPE 'O' STRAIN FROM THE PHILIPPINES

On 'O' strain of FMD virus has been received from the Philippines and has been compared with reference viruses in one-way complement fixation tests.

The viruses used in the investigations were:

- O₁ Lombardy - the standard O₁ subtype originating in Europe in 1943.
- O₂ Brescia - O₂ variant responsible for epizootics in Europe 1937-1050, and in the United Kingdom up to 1958.
- O₅ India 1/62 - received from Dr. Murty, isolated from outbreaks in Moradabad District in India.
- O Phil. 1/72 - received 1.11.72 from Dr. Refuerzo and isolated from cattle in Benguet (Mountain Province), Philippines.



Comments

Although the profiles show that the India 1/62 serum has a high level of cross-reactivity with all the strains, they do indicate that Phil 1/72 has closest relationship with O₅ India, and reacts better with O₁ Lombardy than O₂ Brescia; the 'r' values being:

Phil 1/72 with India 1/62	- 1.5
Phil 1/72 " O ₁ Lombardy	- 0.5
Phil 1/72 " O ₂ Brescia	- 0.4

Tests have also been carried out with O₁₁ Indonesia 1/62 and the, as yet, unclassified Hong Kong 21/70. These have so far been inconclusive, and the preparation of an homologous Phil 1/72 serum is considered necessary before giving a further opinion.

In the meantime, since an O₅ vaccine is unlikely to be available, the earlier recommendation is endorsed that O₁ vaccine in repeated doses should be used in the present outbreak in the Philippines.

5th December 1972

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THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 19

FMD TYPE 'C' STRAINS FROM ROMANIA AND HUNGARY

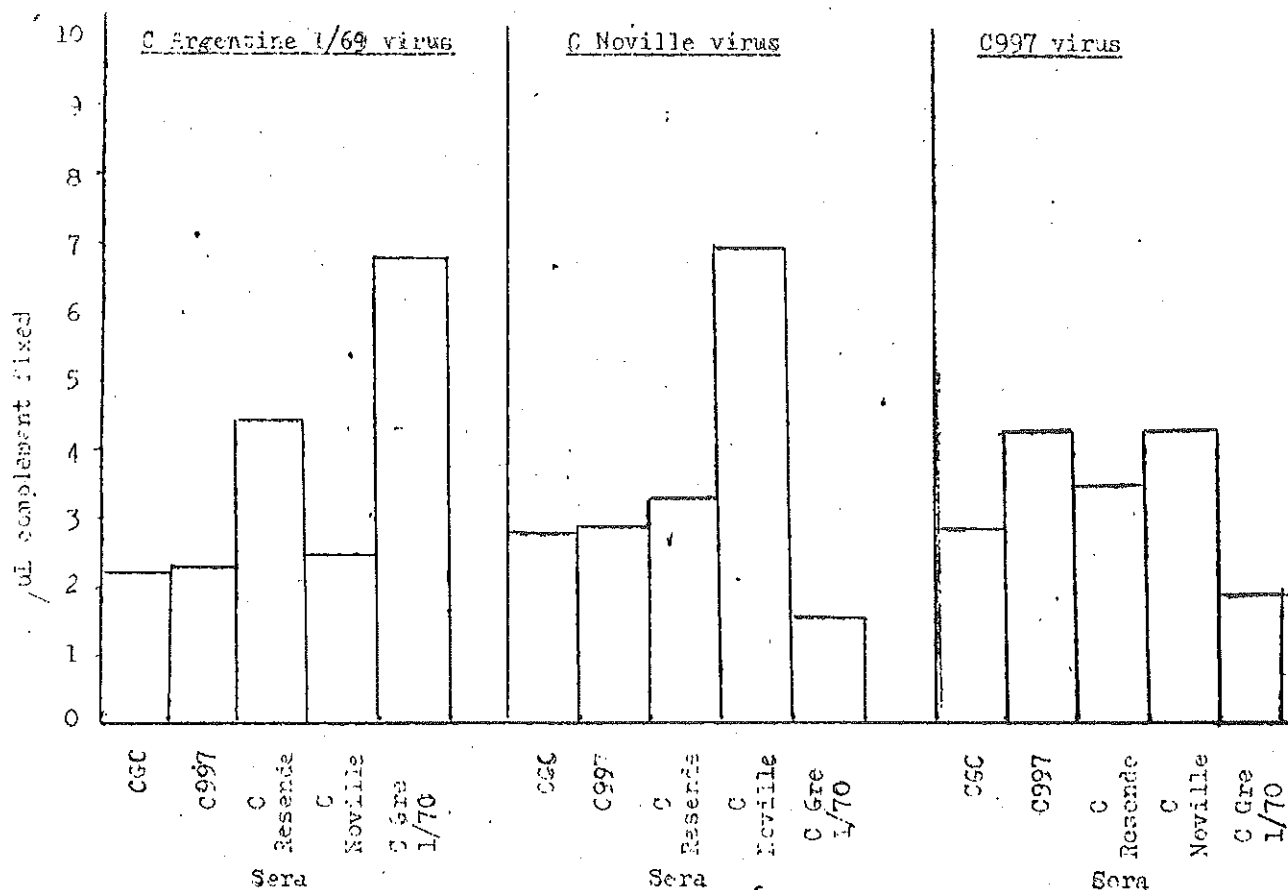
Type 'C' viruses have been isolated from material received from outbreaks in Romania and Hungary, they are as follows:

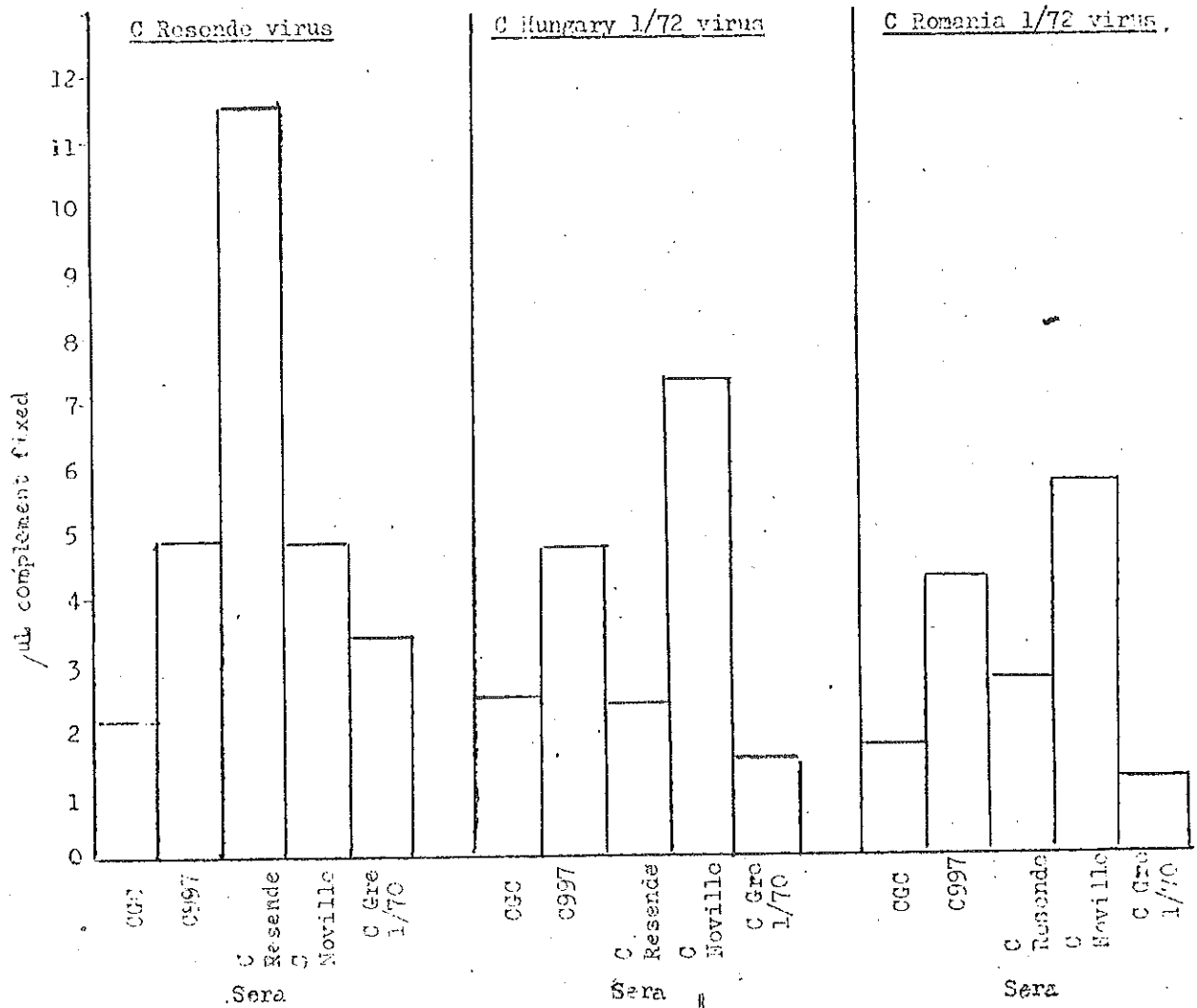
- Rom 1/72 - Received from Dr. Mantiu, 30.11.72 . No further details given.
- Hun 1/72 - Received from Dr. Bognár Károly, 30.11.72. This was a field sample, otherwise no further details provided.

These new viruses have been compared in one-way complement fixation tests with four reference strains, which were:

- C Argentine 69 - for details see Information Sheet No. 8
- C 997 } - see Information Sheet No. 3
- C Resende }
- C Noville - C Vaccine Strain received from T.W.F. Pay, Esq., Burroughs Wellcome.

Because no high-titred C Argentine 69 hyperimmune guinea-pig serum was available, antiserum to Gre 1/70 virus, previously shown to be related to C Argentine 69 and C Belgium 69, has been employed in these tests.





Comments on results

1. C Rom 1/72 and C Hun 1/72 have similar profiles.
2. Both the new strain have a greater fixation with C Noville antiserum and cross-fix to a lesser extent with C997 serum.
3. Little fixation with Gre 1/70 serum indicating no similarity with the group of strains including Bel 1/69 and Arg 1/69.
4. In view of the good reaction with C Noville serum and the general similarity between C Noville and other European vaccine strains (see report to European Commission meeting (Ankara 1971)), the current European C vaccine would seem best likely to protect against the new strain.

21st December, 1972

A.E.M. ARROWSMITH

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 20

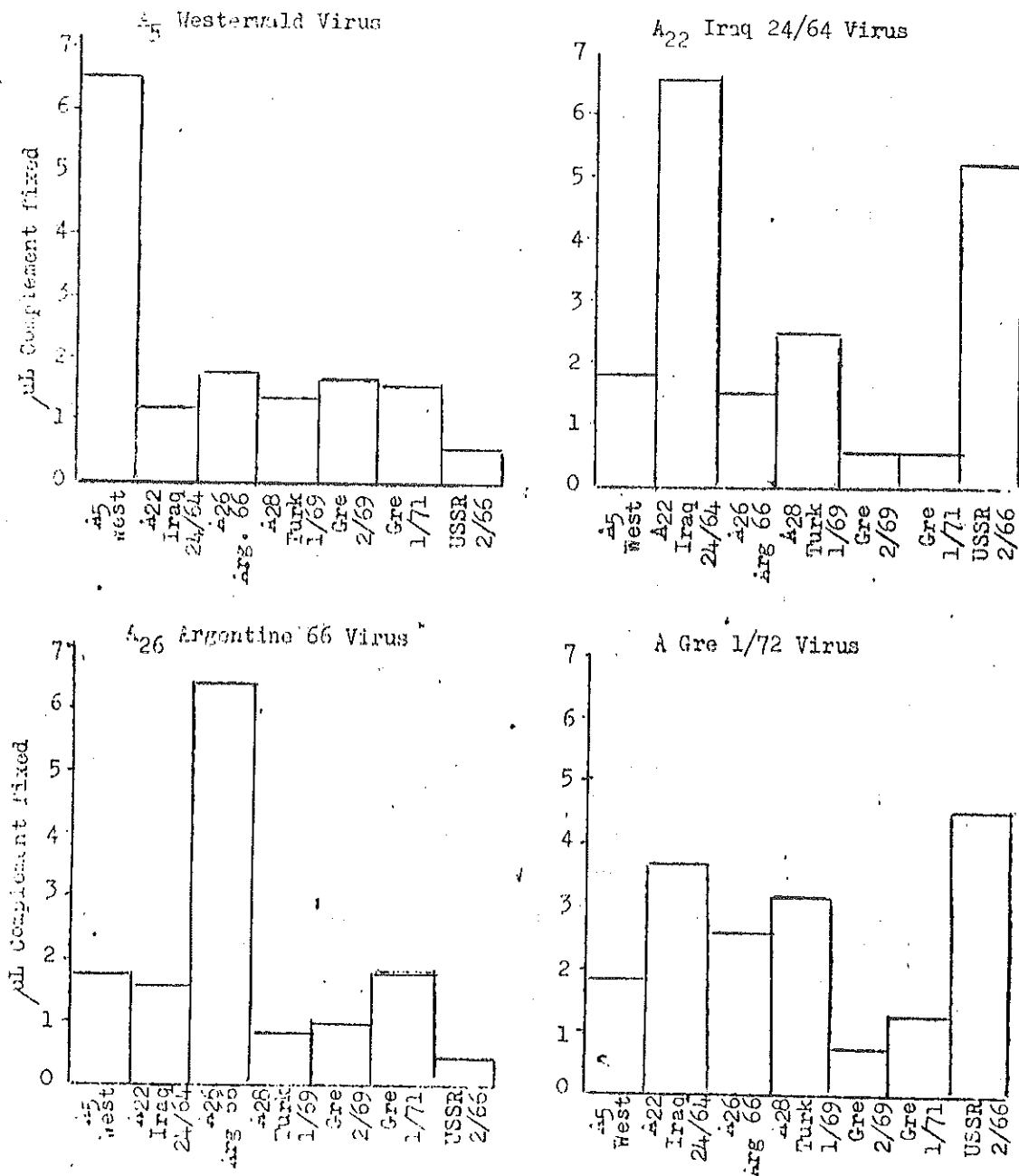
FMD TYPE 'A' STRAIN FROM BULGARIA

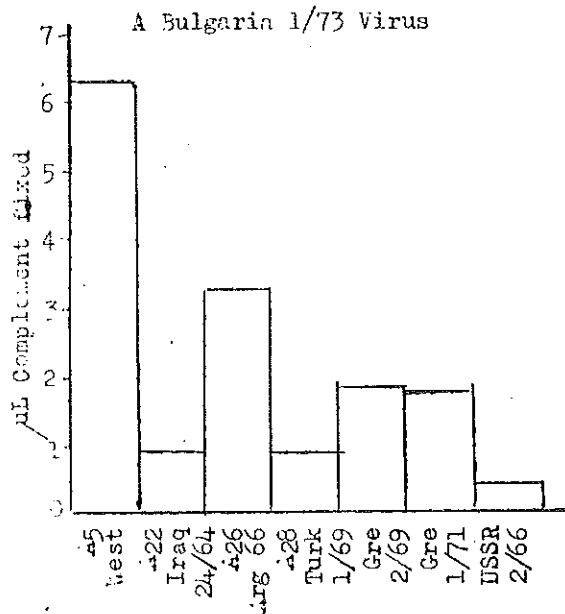
An 'A' strain of FMD virus has been received from Bulgaria, and examined on one-way complement-fixation tests employing the reference strains as used for Gre 1/72 (WRL Sheet No. 13).

Details of the new isolate are as follows:

BUL 1/73

A samples received from Dr. Chenchev on 8.1.73 from an outbreak in cattle in Nova Cherna village, district of Silistra, Bulgaria.





Comments on results

1. Profiles of A₅ Westerwald and A. Bul 1/73 viruses are similar.
2. With A. Bul 1/73 there is some cross-fixation with A₂₆ Argentine antiserum, greater than that with A₅ virus.
3. The new virus shows no similarity with the profiles of A₂₂ Iraq 24/64, A₂₆ Argentine, or Gre 1/72.
4. The high fixation with A₅ serum suggests that the use of A₅ vaccine would best protect against the new strain.

22nd January, 1973

A.E.M. ARROWSMITH

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 21

ASIA 1

The reported spread of this type in Iran and Turkey justifies a preliminary report on the subtyping of the strain although results are limited to the one-way test.

Results on earlier strains of this type were presented in Information Sheet No. 5, August 1969, a copy of which is appended.

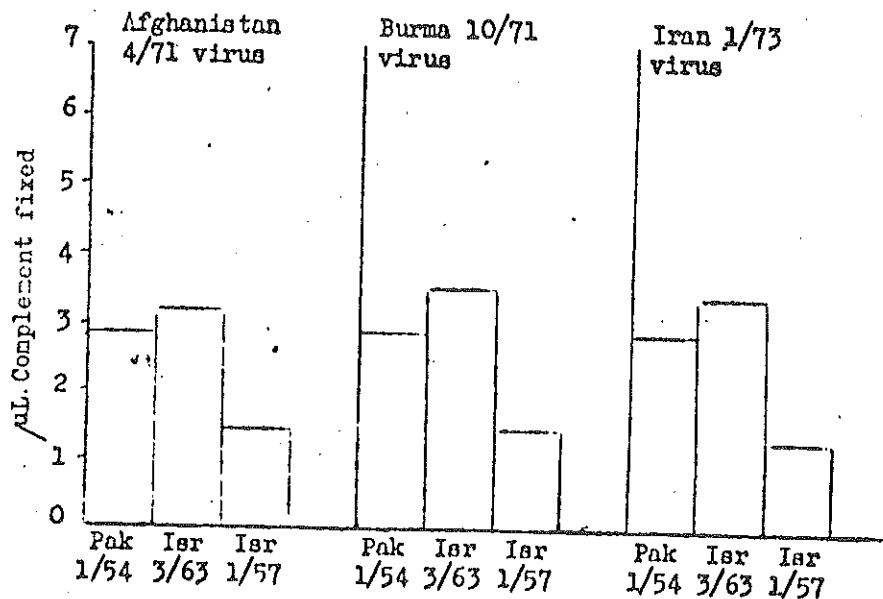
The strains on which now information is available are:

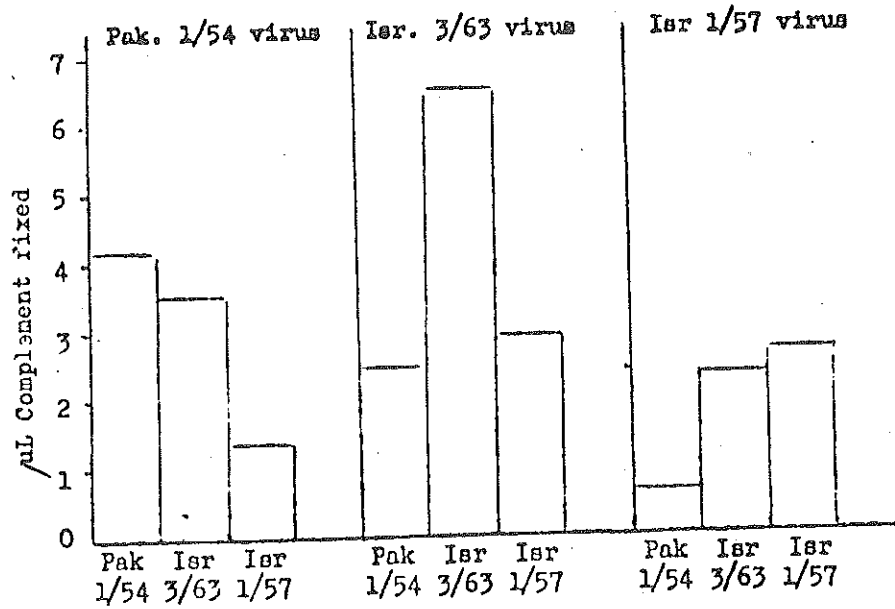
- IRAN 1/73: Material received (27.6.73) in the 6th cell culture passage from the Razi Institute, Teheran, derived from the current Asia 1 outbreak in that neighbourhood.
- AFG 4/71: From an outbreak at Karez-i-mir, Afghanistan, received at Pirbright 15th November 1971.
- BUR 10/71: From an outbreak at Sagaing, Burma, received at Pirbright 6th December, 1971.

These strains have been compared with 3 of the strains described in Information Sheet No. 5, viz:

- PAK 1/54 the first Asia 1 strain described
- ISR 1/57 the first outbreak of Asia 1 in Israel, described by Kemron
- ISR 3/63 a field outbreak at Yokneam, Israel in 1963.

The tests have been one-way complement fixation tests at 60 min. fixation. The results are shown diagrammatically in Fig. 1.





The Iran strain appears to be similar to those from Afghanistan and Burma. Of the three earlier viruses it would appear to differ from Isr 1/57 but could be related to Isr 3/63 or Pak 1/54.

A homologous serum is in preparation to resolve the situation.

22nd August, 1973

A. E. M. ARROWSMITH

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 5

RELATIONSHIP OF TYPE ASIA 1 STRAINS

Although there is relatively little current interest in the Asia 1 subtypes, this subject may at any time become important. The following table gives the R values for four strains which have been investigated.

The strains concerned are:

- PAK 1/54: The Pakistan strain which was the first recognized Asia 1.
- ISR 3/63: An Israel field strain from Yokneam.
- ISR 1/57: The first Asia 1 recognized in Israel by Kemron in 1957.
- IRAN 7/64: Animals coming from Korassan, 1964.

R Values

Virus	PAK.1/54	ISR.3/63	ISR.1/57	IRAN.7/64
PAK.1/54	100	46	23	68
ISR.3/63		100	47	32
ISR.1/57			100	43
IRAN.7/64				100

August, 1969

J.B. Brooksby

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 22

RELATIONSHIP OF MIDDLE EAST ASIA 1

The Asia 1 strain from Iran has now been examined on cross-fixation tests, and relationships with the 3 reference viruses have been obtained.

The strains used in this work have previously been described in Information Sheet No. 21.

Two sets of figures are shown in the tables below; those marked with an asterisk have been obtained by the Standard test using varying serum and complement with constant antigen and 60 min. fixation period. The second set has been given by a Chessboard test, also of 60 min. fixation time, with dilutions of antigen and serum.

Virus	Pak 1/54	Israel 3/63	Israel 1/57	Iran 1/73
Serum Pak 1/54	<u>1.0</u>	0.53 0.56*	0.15	0.71 0.82*
Israel 3/63	0.62 0.54*	<u>1.0</u>	0.33	0.67 0.60*
Israel 1/57	0.39	0.75	<u>1.0</u>	0.47
Iran 1/73	0.94 0.81*	0.77 0.62*	0.1	<u>1.0</u>

Pak 1/54	100			
Israel 3/63	57 55*	100		
Israel 1/57	24	50	100	
Iran 1/73	82 82*	72 61*	22	100
	Pak 1/54	Israel 3/63	Israel 1/57	Iran 1/73

From the above tables, the new strain in the Middle East has been shown to be very closely related to Pak 1/54, with a lesser relationship with Israel 3/63, and different from Israel 1/57; these results confirm those recorded - W.R.L. Information Sheet No. 21.

12th October, 1973

A.E.M. ARROWSMITH

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO.23

FMD TYPE 'C' IN JERSEY

This information sheet reports the initial work on subtyping the 'C' strain from Jersey.

The viruses involved in these investigations were as follows:

UKG/70/74. Bovine epithelium from the outbreak in St. Ouen, Jersey, received in W.R.L. 18.2.74. 8 out of 9 animals, all cattle, were affected and all these were cows, one bull remained unaffected at time of slaughter.

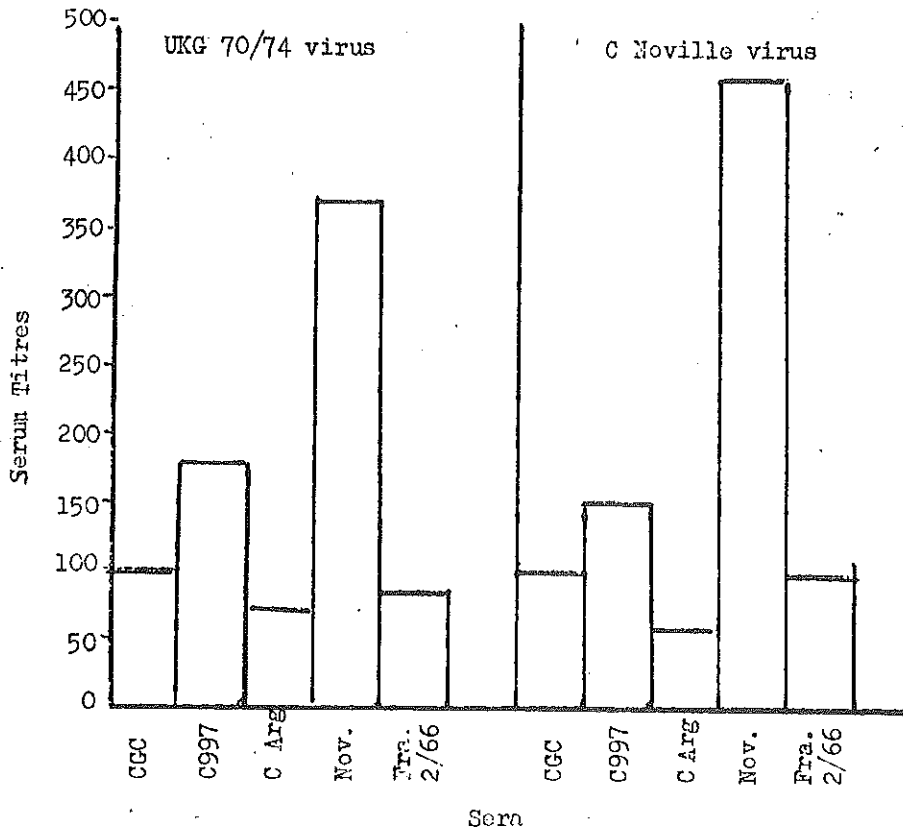
Reference viruses:

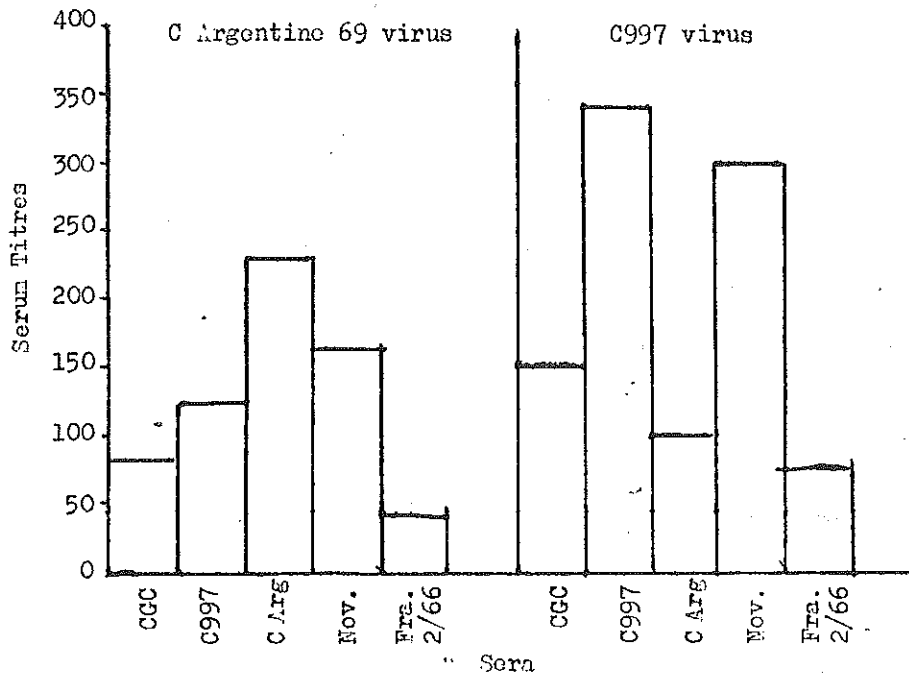
C Noville. 'C' vaccine strain received from T.W.F. Pay, Esq., Burroughs Wellcome (See Information Sheet No. 19).

C Argentine 69. This strain was isolated from lesions in vaccinated cattle in outbreaks in the Province of Buenos Aires in 1969 (See Information Sheet No. 8).

C997. British field strain, 1953, probably of South American origin (See Information Sheet No. 3).

In the absence of an homologous serum, the new strain (UKG 70/74) was compared with the above reference viruses on one-way complement fixation tests using a chessboard technique and a 60 min. fixation period.





Comments

From these profiles there are clear indications that the current Jersey strain is similar to C Noville.

An antiserum to the new strain is being prepared, after which a more definitive subtyping investigation will be made. In the meantime, however, it is relevant to comment that the C Noville is representative of a group of 'C' strains which have been prevalent in Europe during the last few years.

28th Febraury, 1974

A.E.M. ARROWSMITH

THE ANIMAL VIRUS RESEARCH INSTITUTE

W.R.L. INFORMATION SHEET NO. 24

FURTHER DATA ON FMD TYPE C IN JERSEY

Since the publication of preliminary data on a strain C from Jersey (Information Sheet No. 23) a hyperimmune guinea pig serum has been prepared against this virus, and used in complement-fixation tests to clarify the relationship between the new strain and reference subtypes.

The viruses included in this present study have all been listed in Information Sheet No. 23, with the exception of CGC which is described in Information Sheet No. 6. The chessboard complement fixation technique employed for the cross-fixation tests has also been mentioned in Information Sheet No. 23.

The following tables show the results obtained:-

VIRUS SERUM	CGC	C997	ARGEN- TINE 69	NOVILLE	UKG 70/74
CGC	<u>1.0</u>	0.71	0.47	0.64	0.63
C997	0.61	<u>1.0</u>	0.42	0.59	0.53
ARGEN- TINE 69	0.45	0.36	<u>1.0</u>	0.31	0.27
NOVILLE	0.55	0.55	0.33	<u>1.0</u>	0.78
UKG 70/74	0.61	0.46	0.27	0.89	<u>1.0</u>

CGC	100				
C997	66	100			
ARGEN- TINE 69	46	39	100		
NOVILLE	59	57	32	100	
UKG 70/74	62	49	27	83	100
	CGC	C997	ARGEN- TINE 69	NOVILLE	UKG 70/74

These tests have shown the Jersey C strain to be closely related to

C. Noville, thus confirming the previous results of Sheet No. 23. Further away in relationship are the other European subtypes C997 and CGC. Finally the results show this new strain to be different from the 1969 Argentine strain.

As previously stated, several outbreaks in Europe in recent years have been due to strains identical or at least closely similar to C Noville.

20th August, 1974

A.E.M. Arrowsmith

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