

1  
LISTADO DE SECUENCIAS

<110> Consejo Superior de Investigaciones Científicas (CSIC)  
Instituto Nacional de Investigación y Tecnología Agraria y  
Alimentaria INIA

<120> vacuna atenuada para la fiebre aftosa

<130> 1641.49

<160> 3

<170> PatentIn version 3.4

<210> 1  
<211> 795  
<212> PRT  
<213> virus de la fiebre aftosa (Aphthovirus) (D417)

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Val Arg Ala Leu Phe Leu Pro Arg Thr Ala Gly Lys Met Glu Phe Thr  
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Leu His Asp Gly Glu Lys Met Val Phe Val Pro Tyr Asp Gln Glu Pro  
35 40 45

Leu Asn Glu Gly Trp Lys Ala Ser Val Gln Arg Lys Leu Lys Gly Ala  
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Gly Gln Ser Ser Pro Ala Thr Gly Ser Gln Asn Gln Ser Gly Asn Thr  
65 70 75 80

Gly Ser Ile Ile Asn Asn Tyr Tyr Met Gln Gln Tyr Gln Asn Ser Met  
85 90 95

Asp Thr Gln Leu Gly Asp Asn Ala Ile Ser Gly Gly Ser Asn Glu Gly  
100 105 110

Ser Thr Asp Thr Thr Ser Ala His Thr Thr Asn Thr Gln Asn Asn Asp  
115 120 125

Trp Phe Ser Lys Leu Ala Ser Ser Ala Phe Ser Gly Leu Phe Gly Ala  
130 135 140

Leu Leu Ala Asp Lys Lys Thr Glu Glu Thr Thr Leu Leu Glu Asp Arg  
145 150 155 160

Ile Leu Thr Thr Arg Asn Gly His Thr Thr Ser Thr Thr Gln Ser Ser  
165 170 175

Val Gly Val Thr Phe Gly Tyr Ala Thr Ala Glu Asp Ser Thr Ser Gly  
180 185 190

Pro Asn Thr<sub>195</sub> Ser Gly Leu Glu Thr<sub>200</sub> Arg Val<sup>2</sup> His Gln Ala<sub>205</sub> Glu Arg Phe  
 Phe Lys<sub>210</sub> Met Ala Leu Phe Asp<sub>215</sub> Trp Val Pro Ser Gln<sub>220</sub> Asn Phe Gly His  
 Met His Lys Val Val Leu<sub>230</sub> Pro His Glu Pro Lys<sub>235</sub> Gly Val Tyr Gly Gly<sub>240</sub>  
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 Thr Ala Val Gly<sub>260</sub> Asn Gln Phe Asn Gly<sub>265</sub> Gly Cys Leu Leu Val<sub>270</sub> Ala Leu  
 Val Pro Glu<sub>275</sub> Met Gly Asp Ile Ser<sub>280</sub> Asp Arg Glu Lys Tyr<sub>285</sub> Gln Leu Thr  
 Leu Tyr<sub>290</sub> Pro His Gln Phe Ile<sub>295</sub> Asn Pro Arg Thr Asn<sub>300</sub> Met Thr Ala His  
 Ile Thr Val Pro Tyr Val<sub>310</sub> Gly Val Asn Arg Tyr<sub>315</sub> Asp Gln Tyr Lys Gln<sub>320</sub>  
 His Arg Pro Trp Thr<sub>325</sub> Leu Val Val Met Val<sub>330</sub> Val Ala Pro Leu Thr<sub>335</sub> Thr  
 Asn Thr Ala Gly<sub>340</sub> Ala Gln Gln Ile Lys<sub>345</sub> Val Tyr Ala Asn Ile<sub>350</sub> Ala Pro  
 Thr Asn Val<sub>355</sub> His Val Ala Gly Glu<sub>360</sub> Leu Pro Ser Lys Glu<sub>365</sub> Gly Ile Phe  
 Pro Val<sub>370</sub> Ala Cys Ser Asp Gly<sub>375</sub> Tyr Gly Asn Met Val<sub>380</sub> Thr Thr Asp Pro  
 Lys Thr Ala Asp Pro Val<sub>390</sub> Tyr Gly Lys Val Tyr<sub>395</sub> Asn Pro Pro Arg Thr<sub>400</sub>  
 Ala Leu Pro Gly Arg<sub>405</sub> Phe Thr Asn Tyr Leu<sub>410</sub> Asp Val Ala Glu Ala<sub>415</sub> Cys  
 Pro Thr Phe Leu<sub>420</sub> Met Phe Glu Asn Val<sub>425</sub> Pro Tyr Val Ser Thr<sub>430</sub> Arg Thr  
 Asp Gly Gln<sub>435</sub> Arg Leu Leu Ala Lys<sub>440</sub> Phe Asp Val Ser Leu<sub>445</sub> Ala Ala Lys  
 His Met<sub>450</sub> Ser Asn Thr Tyr Leu<sub>455</sub> Ala Gly Leu Ala Gln<sub>460</sub> Tyr Tyr Thr Gln  
 Tyr Thr Gly Thr Ile Asn Leu His Phe Met Phe Thr Gly Pro Thr Asp

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Ala	Lys	Ala	Arg	Tyr 485	Met	Val	Ala	Tyr	Val 490	Pro	Pro	Gly	Met	Asp 495	Ala
Pro	Asp	Asn	Pro 500	Glu	Glu	Ala	Ala	His 505	Cys	Ile	His	Ala	Glu 510	Trp	Asp
Thr	Gly	Leu 515	Asn	Ser	Lys	Phe	Thr 520	Phe	Ser	Ile	Pro	Tyr 525	Ile	Ser	Ala
Ala	Asp 530	Tyr	Ala	Tyr	Thr	Ala 535	Ser	Asp	Lys	Ala	Glu 540	Thr	Thr	Cys	Val
Gln 545	Gly	Trp	Val	Cys	Val 550	Tyr	Gln	Ile	Thr	His 555	Gly	Lys	Ala	Asp	Ala 560
Asp	Ala	Leu	Val	Val 565	Ser	Ala	Ser	Ala	Gly 570	Lys	Asp	Phe	Glu	Leu 575	Arg
Leu	Pro	Val	Asp 580	Ala	Arg	Lys	Gln	Thr 585	Thr	Thr	Thr	Gly	Glu 590	Ser	Ala
Asp	Pro	Val 595	Thr	Thr	Thr	Val	Glu 600	Asn	Tyr	Gly	Gly	Glu 605	Thr	Gln	Val
Gln	Arg 610	Arg	His	His	Thr	Asp 615	Val	Ala	Phe	Val	Leu 620	Asp	Arg	Phe	Val
Glu 625	Val	Thr	Val	Ser	Gly 630	Asn	Gln	His	Thr	Leu 635	Asp	Val	Met	Gln	Ala 640
His	Lys	Asp	Asn	Ile 645	Val	Gly	Ala	Leu	Leu 650	Arg	Ala	Ala	Thr	Tyr 655	Tyr
Phe	Ser	Asp	Leu 660	Glu	Ile	Ala	Val	Thr 665	His	Thr	Gly	Lys	Leu 670	Thr	Trp
Val	Pro	Asn 675	Gly	Ala	Pro	Val	Ser 680	Ala	Leu	Asn	Asn	Thr 685	Thr	Asn	Pro
Thr	Ala 690	Tyr	His	Lys	Gly	Pro 695	Val	Thr	Arg	Leu	Ala 700	Leu	Pro	Tyr	Thr
Ala 705	Pro	His	Arg	Val	Leu 710	Ala	Thr	Ala	Tyr	Thr 715	Gly	Thr	Thr	Thr	Tyr 720
Thr	Ala	Ser	Ala	Arg 725	Gly	Asp	Leu	Ala	His 730	Leu	Thr	Thr	Thr	His 735	Ala
Arg	His	Leu	Pro 740	Thr	Ser	Phe	Asn	Phe 745	Gly	Ala	Val	Lys	Ala 750	Glu	Thr

Ile Thr Glu Leu Leu Val Arg Met Lys Arg Ala Glu Leu Tyr Cys Pro  
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Arg Pro Ile Leu Pro Ile Gln Pro Thr Gly Asp Arg Arg Lys Gln Pro  
770 775 780

Leu Val Ala Pro Ala Ala Val Cys Gly Asp Ala  
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 <213> Virus de la fiebre aftosa (Aphthovirus) (D999)  
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Met Asn Thr Thr Asp Cys Phe Ile Ala Leu Val Asn Ala Ile Lys Glu  
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Val Arg Ala Leu Phe Leu Pro Arg Thr Ala Gly Lys Met Glu Phe Thr  
20 25 30

Leu His Asp Gly Glu Lys Lys Val Phe Tyr Ser Arg Pro Asn Asn Tyr  
35 40 45

Asp Asn Cys Trp Leu Asn Thr Ile Leu Gln Leu Phe Arg Tyr Val Asp  
50 55 60

Glu Pro Phe Phe Asp Trp Val Tyr Asn Ser Pro Glu Asn Leu Thr Leu  
65 70 75 80

Glu Ala Ile Lys Gln Leu Glu Glu Leu Thr Gly Leu Glu Leu Arg Glu  
85 90 95

Gly Gly Pro Pro Ala Leu Val Ile Trp Asn Ile Lys His Leu Leu His  
100 105 110

Thr Gly Ile Gly Thr Ala Ser Arg Pro Ser Glu Val Cys Met Val Asp  
115 120 125

Gly Thr Asp Met Cys Leu Ala Asp Phe His Ala Gly Ile Phe Met Lys  
130 135 140

Gly Arg Glu His Ala Val Phe Ala Cys Val Thr Ser Asn Gly Trp Tyr  
145 150 155 160

Ala Ile Asp Asp Glu Asp Phe Tyr Pro Trp Thr Pro Asp Pro Ser Asp  
165 170 175

Val Leu Val Phe Val Pro Tyr Asp Gln Glu Pro Leu Asn Glu Gly Trp  
180 185 190

Lys Ala Ser Val Leu Arg Lys Leu Lys Gly<sup>5</sup> Ala Gly Gln Ser Ser Pro  
 195 200 205

Ala Thr Gly Ser Gln Asn Gln Ser Gly Asn Thr Gly Ser Ile Ile Asn  
 210 215 220

Asn Tyr Tyr Met Gln Gln Tyr Gln Asn Ser Met Asp Thr Gln Leu Gly  
 225 230 235 240

Asp Asn Ala Ile Ser Gly Gly Ser Asn Glu Gly Ser Thr Asp Thr Thr  
 245 250 255

Ser Thr His Thr Thr Asn Thr Gln Asn Asn Asp Trp Phe Ser Lys Leu  
 260 265 270

Ala Ser Ser Ala Phe Ser Gly Leu Phe Gly Ala Leu Leu Ala Asp Lys  
 275 280 285

Lys Thr Glu Glu Thr Thr Leu Leu Glu Asp Arg Ile Leu Thr Thr Arg  
 290 295 300

Asn Gly His Thr Thr Ser Thr Thr Gln Ser Ser Val Gly Val Thr Phe  
 305 310 315 320

Gly Tyr Ala Thr Ala Glu Asp Ser Thr Ser Gly Pro Asn Thr Ser Gly  
 325 330 335

Leu Glu Thr Arg Val His Gln Ala Glu Arg Phe Phe Lys Met Ala Leu  
 340 345 350

Phe Asp Trp Val Pro Ser Gln Asn Phe Gly His Met His Lys Val Val  
 355 360 365

Leu Pro His Glu Pro Lys Gly Val Tyr Gly Gly Leu Val Lys Ser Tyr  
 370 375 380

Ala Tyr Met Arg Asn Gly Trp Asp Val Glu Val Thr Ala Val Gly Asn  
 385 390 395 400

Gln Phe Asn Gly Gly Cys Leu Leu Val Ala Leu Val Pro Glu Met Asp  
 405 410 415

Asp Ile Ser Asp Arg Glu Lys Tyr Gln Leu Thr Leu Tyr Pro His Gln  
 420 425 430

Phe Ile Asn Pro Arg Thr Asn Met Thr Ala His Ile Thr Val Pro Tyr  
 435 440 445

Val Gly Val Asn Arg Tyr Asp Gln Tyr Lys Gln His Arg Pro Trp Thr  
 450 455 460

Leu Val Val Met Val Val Ala Pro Leu Thr Thr Asn Thr Ala Gly Ala

465											470											475											480
Gln	Gln	Ile	Lys	Val 485	Tyr	Ala	Asn	Ile	Ala 490	Pro	Thr	Asn	Val	His 495	Val																		
Ala	Gly	Glu	Leu 500	Pro	Ser	Lys	Glu	Gly 505	Ile	Phe	Pro	Val	Ala 510	Cys	Ser																		
Asp	Gly	Tyr 515	Gly	Asn	Met	Val	Thr 520	Thr	Asp	Pro	Lys	Thr 525	Ala	Asp	Pro																		
Val	Tyr 530	Gly	Lys	Val	Tyr	Asn 535	Pro	Pro	Arg	Thr	Ala 540	Leu	Pro	Gly	Arg																		
Phe 545	Thr	Asn	Tyr	Leu	Asp 550	Val	Ala	Glu	Ala	Cys 555	Pro	Thr	Phe	Leu	Met 560																		
Phe	Glu	Asn	Val	Pro 565	Tyr	Val	Ser	Thr	Arg 570	Thr	Asp	Gly	Gln	Ser 575	Leu																		
Leu	Ala	Lys	Phe 580	Asp	Val	Ser	Leu	Ala 585	Arg	Arg	Lys	Gln	Pro 590	Leu	Val																		
Ala	Pro	Ala 595	Ala	Val	Cys	Gly	Asp 600	Ala																									
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Met 1	Asn	Thr	Thr	Asp 5	Cys	Phe	Ile	Ala	Val 10	Val	Asn	Ala	Ile	Lys 15	Glu																		
Val	Ile	Ala	Leu 20	Phe	Leu	Ser	Arg	Thr 25	Ala	Gly	Lys	Met	Glu 30	Phe	Thr																		
Leu	His	Asp 35	Gly	Glu	Lys	Lys	Val 40	Phe	Tyr	Ser	Arg	Pro 45	Asn	Asn	His																		
Asp	Asn 50	Cys	Trp	Leu	Asn	Thr 55	Ile	Leu	Gln	Leu	Phe 60	Arg	Tyr	Val	Asp																		
Glu 65	Pro	Phe	Phe	Asp	Trp 70	Val	Tyr	Asn	Ser	Pro 75	Glu	Asn	Leu	Thr	Leu																		
Glu	Ala	Ile	Lys	Gln 85	Leu	Glu	Glu	Leu	Thr 90	Gly	Leu	Glu	Leu	Arg 95	Glu																		
Gly	Gly	Pro	Pro 100	Ala	Leu	Val	Ile	Trp 105	Asn	Ile	Lys	His	Leu 110	Leu	His																		

Thr Gly Ile Gly Thr Ala Ser Arg Pro Ser Glu Val Cys Met Val Asp  
 115 120 125  
 Gly Thr Asp Met Cys Leu Ala Asp Phe His Ala Gly Ile Phe Met Lys  
 130 135 140  
 Gly Arg Glu His Ala Val Phe Ala Cys Val Thr Ser Asn Gly Trp Tyr  
 145 150 155 160  
 Ala Ile Asp Asp Glu Asp Phe Tyr Pro Trp Thr Pro Asp Pro Ser Asp  
 165 170 175  
 Val Leu Val Phe Val Pro Tyr Asp Gln Glu Pro Leu Asn Glu Gly Trp  
 180 185 190  
 Lys Ala Ser Val Leu Arg Lys Leu Arg Gly Ala Gly Gln Ser Ser Pro  
 195 200 205  
 Ala Thr Gly Ser Gln Asn Gln Ser Gly Asn Thr Gly Ser Ile Ile Asn  
 210 215 220  
 Asn Tyr Tyr Met Gln Gln Tyr Gln Asn Ser Met Asp Thr Gln Leu Gly  
 225 230 235 240  
 Asp Asn Ala Ile Ser Gly Gly Ser Asn Glu Gly Ser Thr Asp Thr Thr  
 245 250 255  
 Ser Thr His Thr Thr Asn Thr Gln Asn Asn Asp Trp Phe Ser Lys Leu  
 260 265 270  
 Ala Ser Ser Ala Phe Ser Gly Leu Phe Gly Ala Leu Leu Ala Asp Lys  
 275 280 285  
 Lys Thr Glu Glu Thr Thr Leu Leu Glu Asp Asn Pro Glu Glu Ala Ala  
 290 295 300  
 His Cys Ile His Ala Glu Trp Asp Thr Gly Leu Asn Ser Lys Phe Thr  
 305 310 315 320  
 Phe Ser Ile Pro Tyr Ile Ser Ala Ala Asp Tyr Ala Tyr Thr Ala Ser  
 325 330 335  
 Asp Lys Ala Glu Thr Thr Cys Val Gln Gly Trp Val Cys Val Tyr Gln  
 340 345 350  
 Ile Thr His Gly Lys Ala Asp Ala Asp Ala Leu Val Val Ser Ala Pro  
 355 360 365  
 Ala Gly Lys Asp Phe Glu Leu Arg Leu Pro Val Asp Ala Arg Lys Gln  
 370 375 380

Thr Thr Thr Thr Gly Glu Ser Ala Asp Pro<sup>8</sup> Val Thr Thr Thr Val Glu  
 385 390 395 400  
 Asn Tyr Gly Gly Glu Thr Gln Val Gln Arg Arg His His Thr Asp Val  
 405 410 415  
 Ala Phe Val Leu Asp Arg Phe Val Glu Val Thr Val Ser Gly Asn Gln  
 420 425 430  
 His Thr Leu Asp Val Met Gln Ala His Lys Asp Asn Ile Val Gly Ala  
 435 440 445  
 Leu Leu Arg Ala Ala Thr Tyr Tyr Phe Ser Asp Leu Glu Ile Ala Val  
 450 455 460  
 Thr His Thr Gly Lys Leu Thr Trp Val Pro Asn Gly Ala Pro Val Ser  
 465 470 475 480  
 Ala Leu Asn Asn Thr Thr Asn Pro Thr Ala Tyr His Lys Gly Pro Val  
 485 490 495  
 Thr Arg Leu Ala Leu Pro Tyr Thr Ala Pro His Arg Val Leu Ala Thr  
 500 505 510  
 Ala Tyr Thr Gly Thr Thr Thr Tyr Thr Ala Ser Ala Arg Gly Asp Leu  
 515 520 525  
 Ala His Leu Thr Thr Thr His Ala Arg His Leu Pro Thr Ser Phe Asn  
 530 535 540  
 Phe Gly Ala Val Lys Ala Glu Thr Ile Thr Glu Leu Leu Val Arg Met  
 545 550 555 560  
 Lys Arg Ala Glu Leu Tyr Cys Pro Arg Pro Ile Leu Pro Ile Gln Pro  
 565 570 575  
 Thr Gly Asp Arg Arg Lys Gln Pro Leu Val Ala Pro Ala Ala Val Cys  
 580 585 590  
 Gly Asp Ala  
 595