CLAIMS

1. An immunogenic composition for the treatment and/or prophylaxis of cattle against microbiological infections, wherein said immunogenic composition comprises

   a. one or more *Mycoplasma bovis* antigens of a *Mycoplasma bovis* bacterium, wherein the *Mycoplasma bovis* bacterium is passaged more than 10 times; and wherein the *Mycoplasma bovis* bacterium is an attenuated, avirulent *Mycoplasma bovis* bacterium selected from the group consisting of: the attenuated *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers, PTA-8694, PTA-8695, or PTA-8696; any attenuated descendant *Mycoplasma bovis* bacteria strains thereof; any attenuated avirulent *Mycoplasma bovis* bacterium strain capable of inducing a humoral immune response in a calf within 14 days after administration of one dose of 2.1E9 CFU via the subcutaneous or intranasal route to the calf, and which does not cause clinical signs normally caused by an infection with a pathogenic *Mycoplasma bovis* wild-type strain, and

   b. one or more further immunologically active component(s) effective for the treatment and/or prophylaxis of microbiological infection in cattle caused by a cattle pathogen other than *Mycoplasma bovis*.

~~2. The immunogenic composition according to claim 1, wherein the *Mycoplasma bovis* antigen is an attenuated, avirulent *Mycoplasma bovis* bacterium.~~

~~3.~~2. The immunogenic composition according to claim 1 ~~or 2~~, wherein the *Mycoplasma bovis* bacterium is passaged more than 50 times.

~~4. The immunogenic composition according to any one of claims 1 to 3, wherein the *Mycoplasma bovis* bacterium is selected from the group consisting of: the attenuated *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers PTA-8694, PTA-8695, or PTA-8696; any attenuated descendant *Mycoplasma bovis* bacteria strains thereof; any attenuated, avirulent *Mycoplasma bovis* bacterium strain having the same characteristics as any of the *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers PTA-8694, PTA-8695 or PTA-8696, and combinations thereof.~~

~~5.~~3. The immunogenic composition according to ~~any one of~~ claims 1 ~~to~~ or ~~4~~2,

wherein said microbiological infection in cattle caused by a cattle pathogen other than *Mycoplasma bovis* is caused by one or more pathogens selected from the group consisting of:

Bovine viral diarrhea virus (BVDV), Parainfluenza-3 Virus (PI-3), Infectious Bovine Rhinotracheitis virus (IBR), Bovine Respiratory Syncytial Virus (BRSV), Bovine Herpesvirus (BHV), Bovine Rotavirus (BRV), Bovine Enterovirus (BEV), Bovine Coronovirus (BCV), Bovine Rabies (BR), Bovine Parvovirus (BPV), Adenovirus Astrovirus, *Mannheimia haemolytica* (formerly *Pasteurella haemolytica*), *Pasteurella multocida*, *Haemophilus somnus* (Histophilus ovis and Haemophilus agni), Actinomyces (Corynebacterium), *Actinomyces pyogenes*, *Chlamydia psittaci*, *Campylobacter fetus venerealis* and *Campylobacter fetus fetus* (formerly C fetus intestinalis), *Leptospira interrogans*, *Leptospira hardjo*, *Leptospira pomona*, and *Leptospira grippotyphosa*, *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira hardjo* (*Leptospira hardjo*prajitno and *Leptospira hardjo*-bovis), *Brucella abortus*, *Brucella suis* and *Brucella melitensis*, *Listeria monocytogenes*, *Chlamydia psittaci*, *Clostridium chauvoei*, *Clostridium septicum*, *Clostridium haemolyticum*, *Clostridium novyi*, *Clostridium sordellii*, *Clostridium perfringens*, *Clostridium tetani*, *Moraxella bovis*, Klebsiella spp, *Klebsiella pneumoniae*, *Salmonella typhimurium*; *Salmonella newport*, *Mycobacterium avium paratuberculosis*, *Cryptsporidium parvum*, *Cryptsporidium hominis*, *Staphylococcus aureus*, *Streptococcus dysgalactiae*, *Streptococcus uberis*, Streptococcus agalactiae, *Escherichia coli*, Mycoplasma spp, *Mycoplasma dispar*, and Ureaplasma spp., *Tritrichomonas foetus*, *Trichophyton verrucosum*, *Trichophyton mentagrophytes*, *Trichophyton sarkisovii*, *Neospora caninum* (formerly *Toxoplasma gondii*), *Babesia bigemina* and *Babesia bovis*,*Dictyocaulus viviparous* (Lungworm disease), and combinations thereof.

~~6.~~4. The immunogenic composition according to any one of claims 1 to ~~5~~3, wherein the further immunologically active component(s) is/are antigen(s) of one or more of the pathogens selected from the group consisting of:

Bovine viral diarrhea virus (BVDV), Parainfluenza-3 Virus (PI-3), Infectious Bovine

Rhinotracheitis virus (IBR), Bovine Respiratory Syncytial Virus (BRSV), Bovine Herpesvirus (BHV), Bovine Rotavirus (BRV), Bovine Enterovirus (BEV), Bovine Coronovirus (BCV), Bovine Rabies (BR), Bovine Parvovirus (PPV), Adenovirus Astrovirus, *Mannheimia haemolytica* (formerly *Pasteurella haemolytica*), *Pasteurella multocida*, *Haemophilus somnus* (Histophilus ovis and Haemophilus agni), Actinomyces (Corynebacterium), *Actinomyces pyogenes*, *Chlamydia psittaci*, *Campylobacter fetus venerealis* and *Campylobacter fetus fetus* (formerly C fetus intestinalis), *Leptospira interrogans*, *Leptospira hardjo*, *Leptospira pomona*, and *Leptospira grippotyphosa*, *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira hardjo* (*Leptospira hardjo*prajitno and *Leptospira hardjo*-bovis), *Brucella abortus*, *Brucella suis* and *Brucella melitensis*, *Listeria monocytogenes*, *Chlamydia psittaci*, *Clostridium chauvoei*, *Clostridium septicum*, *Clostridium haemolyticum*, *Clostridium novyi*, *Clostridium sordellii*, *Clostridium perfringens*, *Clostridium tetani*, *Moraxella bovis*, Klebsiella spp, *Klebsiella pneumoniae*, *Salmonella typhimurium*; *Salmonella newport*, *Mycobacterium avium paratuberculosis*, *Cryptsporidium parvum*, *Cryptsporidium hominis*, *Staphylococcus aureus*, *Streptococcus dysgalactiae*, *Streptococcus uberis*, , Streptococcus agalactia, *Escherichia coli*, Mycoplasma spp, *Mycoplasma dispar*, and Ureaplasma spp., *Tritrichomonas foetus*, *Trichophyton verrucosum*, *Trichophyton mentagrophytes*, *Trichophyton sarkisovii*, *Neospora caninum* (formerly *Toxoplasma gondii*), *Babesia bigemina* and *Babesia bovis*, *Dictyocaulus viviparous* (Lungworm disease), and combinations thereof.

~~7.~~5. The immunogenic composition according to any one of claims 1 to ~~6~~4, wherein the immunogenic composition is a combination vaccine.

~~8.~~6. The immunogenic composition according to claims 1 to ~~6~~4 or the vaccine according to claim ~~7~~5, wherein said immunogenic composition or vaccine is formulated for a single-dose administration.

~~9.~~7. Use of

a. one or more *Mycoplasma bovis* antigens of a *Mycoplasma bovis* bacterium, wherein the *Mycoplasma bovis* bacterium is passaged more than 10 times; wherein the *Mycoplasma bovis* bacterium is an attenuated, avirulent *Mycoplasma bovis* bacterium selected from the group consisting of the attenuated *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers PTA-8694, PTA-8695 or PTA-8696; any attenuated descendant *Mycoplasma bovis* bacteria strains thereof; any attenuated, avirulent *Mycoplasma bovis* bacterium strain capable of inducing a humoral immune response in a calf within 14 days after administration of one dose of 2.1E9 CFU via the subcutaneous or intranasal route to the calf, and which does not cause clinical signs normally caused by an infection with a pathogenic *Mycoplasma bovis* wild-type strain, and

b. one or more further immunologically active component(s) effective for the treatment and/or prophylaxis of microbial infection in cattle caused by a cattle pathogen other than *Mycoplasma bovis*,

in the manufacture of a medicament for the treatment and/or prophylaxis of cattle against microbiological infections.

~~10. The use according to claim 9, wherein the *Mycoplasma bovis* antigen is an attenuated, avirulent *Mycoplasma bovis* bacterium.~~

~~11.~~8. The use according to ~~any one of~~ claims ~~9~~ 7 ~~to 10~~, wherein the *Mycoplasma bovis* bacterium is passaged more than 50 times.

~~12. The use according to any one of claims 9 to 11, wherein the *Mycoplasma bovis* bacterium is selected from the group consisting of: the attenuated *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers PTA-8694, PTA-8695 or PTA-8696; any attenuated descendant *Mycoplasma bovis* bacteria strains thereof; any attenuated, avirulent *Mycoplasma bovis* bacterium strain having the same characteristics as any of the *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers PTA-8694, PTA-8695 or PTA-8696; and combinations thereof.~~

~~13.~~9. The use according to ~~any one of~~ claims ~~9~~ 7 ~~to~~ or ~~12~~8, wherein the *Mycoplasma bovis* antigen is inactivated.

~~14.~~10. The use according to any one of claims ~~9~~ 7 to ~~13~~9, wherein said infection caused by a further cattle relevant pathogen other than *Mycoplasma bovis* is caused by at least one pathogen selected from the group consisting of:

Bovine viral diarrhea virus (BVDV), Parainfluenza-3 Virus (PI-3), Infectious Bovine

Rhinotracheitis virus (IBR), Bovine Respiratory Syncytial Virus (BRSV), Bovine Herpesvirus (BHV), Bovine Rotavirus (BRV), Bovine Enterovirus (BEV), Bovine Coronovirus (BCV), Bovine Rabies (BR), Bovine Parvovirus (PPV), Adenovirus Astrovirus, *Mannheimia haemolytica* (formerly *Pasteurella haemolytica*), *Pasteurella multocida*, *Haemophilus somnus* (Histophilus ovis and Haemophilus agni), Actinomyces (Corynebacterium), *Actinomyces pyogenes*, *Chlamydia psittaci*, *Campylobacter fetus venerealis* and *Campylobacter fetus fetus* (formerly C fetus intestinalis), *Leptospira interrogans*, *Leptospira hardjo*, *Leptospira pomona*, and *Leptospira grippotyphosa*, *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira hardjo* (*Leptospira hardjo*prajitno and *Leptospira hardjo*-bovis), *Brucella abortus*, *Brucella suis* and *Brucella melitensis*, *Listeria monocytogenes*, *Chlamydia psittaci*, *Clostridium chauvoei*, *Clostridium septicum*, *Clostridium haemolyticum*, *Clostridium novyi*, *Clostridium sordellii*, *Clostridium perfringens*, *Clostridium tetani*, *Moraxella bovis*, Klebsiella spp, *Klebsiella pneumoniae*, *Salmonella typhimurium*; *Salmonella newport*, *Mycobacterium avium paratuberculosis*, *Cryptsporidium parvum*, *Cryptsporidium hominis*, *Staphylococcus aureus*, *Streptococcus dysgalactiae*, *Streptococcus uberis*, *Streptococcus agalactiae, Escherichia coli,* Mycoplasma spp, *Mycoplasma dispar*, and Ureaplasma spp., *Tritrichomonas foetus*, *Trichophyton verrucosum*, *Trichophyton mentagrophytes*, *Trichophyton sarkisovii*, *Neospora caninum* (formerly *Toxoplasma gondii*), *Babesia bigemina* and *Babesia bovis*, *Dictyocaulus viviparous* (Lungworm disease), and combinations thereof.

~~15.~~11. The use according to any one of claims ~~9~~7 to ~~14~~10, wherein the further immunologically active component(s) is/are antigen(s) of one or more of the pathogens selected from the group consisting of: Bovine viral diarrhea virus (BVDV), Parainfluenza-3 Virus (PI-3), Infectious Bovine Rhinotracheitis virus (IBR), Bovine Respiratory Syncytial Virus (BRSV), Bovine Herpesvirus (BHV), Bovine Rotavirus (BRV), Bovine Enterovirus (BEV), Bovine Coronovirus (BCV), Bovine Rabies (BR), Bovine Parvovirus (PPV), Adenovirus

Astrovirus, *Mannheimia haemolytica* (formerly *Pasteurella haemolytica*), *Pasteurella multocida*, *Haemophilus somnus* (Histophilus ovis and Haemophilus agni), Actinomyces (Corynebacterium), *Actinomyces pyogenes*, *Chlamydia psittaci*, *Campylobacter fetus venerealis* and *Campylobacter fetus fetus* (formerly C fetus intestinalis), *Leptospira interrogans*, *Leptospira hardjo*, *Leptospira pomona*, and *Leptospira grippotyphosa*, *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira hardjo* (*Leptospira hardjo*prajitno and *Leptospira hardjo*-bovis), *Brucella abortus*, *Brucella suis* and *Brucella melitensis*, *Listeria monocytogenes*, *Chlamydia psittaci*, *Clostridium chauvoei*, *Clostridium septicum*, *Clostridium haemolyticum*, *Clostridium novyi*, *Clostridium sordellii*, *Clostridium perfringens*, *Clostridium tetani*, *Moraxella bovis*, Klebsiella spp, *Klebsiella pneumoniae*, *Salmonella typhimurium*; *Salmonella newport*, *Mycobacterium avium paratuberculosis*, *Cryptsporidium parvum*, *Cryptsporidium hominis*, *Staphylococcus aureus*, *Streptococcus dysgalactiae*, *Streptococcus uberis*, Streptococcus agalactiae, *Escherichia coli*, Mycoplasma spp, *Mycoplasma dispar*, and Ureaplasma spp., *Tritrichomonas foetus*, *Trichophyton verrucosum*, *Trichophyton mentagrophytes*, *Trichophyton sarkisovii*, *Neospora caninum* (formerly *Toxoplasma gondii*), *Babesia bigemina* and *Babesia bovis*, *Dictyocaulus viviparous* (Lungworm disease), and combinations thereof.

~~16.~~12. The use according to any one of claims ~~9~~ 7 to ~~15~~11, wherein the *Mycoplasma bovis* antigen and the further immunologically active component(s) are administered separately.

~~17.~~13. The use according to claim ~~16~~12, wherein the separate co-administration of the *Mycoplasma bovis* antigen and the further immunologically active component(s) occurs within 2 days.

~~18.~~14. The use according to any one of claims ~~9~~ 7 to ~~17~~13, wherein said medicament is

formulated as a fix-dose combination vaccine.

~~19.~~15. The use according to any one of claims ~~9~~7 to ~~17~~13, wherein said medicament is in one only dose.

~~20.~~16. The use according to any one of claims ~~9~~7 to ~~19~~15, wherein said medicament is effective in lessening or reducing the signs of a *Mycoplasma bovis* infection.

~~21.~~17. A combination of a *Mycoplasma bovis* antigen and one or more further immunologically active component(s) effective for the treatment and/or prophylaxis of infections caused by a further cattle relevant pathogen other than *Mycoplasma bovis* for use as a medicament, wherein said *Mycoplasma bovis* antigen is a *Mycoplasma bovis* antigen of a *Mycoplasma bovis* bacterium, wherein the *Mycoplasma bovis* bacterium is passaged more than 10 times, wherein the *Mycoplasma bovis* bacterium is an attenuated, avirulent *Mycoplasma bovis* bacterium selected from the group consisting of: the attenuated *Mycoplasma bovis* bacteria strains deposited with the ATCC under accession numbers, PTA-8694, PTA-8695, or PTA-8696; any attenuated descendant *Mycoplasma bovis* bacteria strains thereof; any attenuated avirulent *Mycoplasma bovis* bacterium strain capable of inducing a humoral immune response in a calf within 14 days after administration of one dose of 2.1E9 CFU via the subcutaneous or intranasal route to the calf, and which does not cause clinical signs normally caused by an infection with a pathogenic Mycoplasma bovis wild-type strain.