

Evolution of animal and human brucellosis in Algeria: a mini narrative review

Anerni n tawla n Malġa n yiġersiwien d yimdanen di Lezzayer: tasjunt tanalasant tilemġit

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Agzul

Tawla n Malġa d aġġan ittenġaġden ġer umdan i d-xeddment tbaktiriyin n tewsit *Brucella spp.* D aġġan amaġġlan u tella deg tmura n wagraġal am Lezzayer anda mazal t-xeddem aġssar deg lmal. Ad d-nawi dagi tasjunt tamatut ġef tawla n Malġa di Lezzayer, anda i tt-id-ufan yakan ġer umdan seg 1895 u deg wass-nni mazal-itt d uġur ameqqran i yimeġġla n tdawsa. Tella teġqafġ deg teġġrutin n yimdanen deg temnaġġt ġer tayeġġ, tamnaġġt yennul uġar d tamnaġġt uzawaġġ i yeġsean weġġd-s aktamur alemmas (taġġrut/100 000 imezdaġġ) n 65.87 teġġfer-itt-id s 9.89 deg temnaġġt Agafa-Asamar ġef wakken i d-iwekġed uġlif n tdawsa. Aktamur n teġġrutin n tawla n Malġa n yizgaren iġedda s uġġar deg 5% ar 0,76% deg tlemmast n yiseġġgasen n 90 d 2014 s usiley imfecceġc anda seld ša yiseġġgasen n wahil n takza d usnefren akġed ucraġġ s teġġzayt REV-1 i d-iheġġga uġlif n tdawsa mazal yegġġuma ad isenger aġġan-agi. Ilaġ d aġġen ad negzu dakken anerni n umġan n teġġrutin timaynutin n yimdanen i ittuġerġen kifkif-it akġed teġġrutin ġer tġeġġten i yellan d aġewin n temsalmit meġqren i umdan di Lezzayer.

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Awalen uġqinen: Amġan, *Brucella*, izgaren, lezzayer, Tawla n Malġa, tġeġġten

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Tazwart

Tawla n Malġa d aġġan ittenġaġden deg uġersiw ar umdan [1–3], i d-t-xeddem tbaktirit i itteġġkin ar tewsit n *Brucella* [2]; *Brucella abortus* akġed *Brucella melitensis* d nutenti i d ssebba n waġġan ar yizgaren d umdan s uġġar [4]. ġer izgaren, tetteġban-d uġar deg tdamsa [5] acku *Brucella* d nettat i d sebba n tġeġġert, d uġray deg ukradyur anegġaru n tadist, d ġelluy n tuġġġa n uyeġġki akġed tmeġliwt tamarant i tazwara n yizgaren yeġsean tawla n Malġa [2,5–8]. Di telkamġ, tawla n Malġa teġse a semdu ġef tnezzut

tagraġlant n yiġersiwien d yifuras i d-ntekkes deg lmal [9]. Imi tneġġed deg uġersiw ar umdan s yiberġan yemġaraden am teġreġtin n uzwu [8] akġed usadur (tissit) n uyeġġki neġ isuddimen-is [10–12]; Aġġan-agi izmer ad d-ixdem azegġal (tġeġġert) akġed temsalmit n texplifin ġer umdan [13–15].

Di Lezzayer, tawla n Malġa tuġal d uġur n tdawsa tazayezt [16] anda taġġrut-ines tġedda deg 0,36 ar 16,76 i 100000 n yimezdaġġ gar 1989 ar 2011 s uġġar, u tennul 28 n imdanen deg useġġas 2010 [17]. ġer yiġersiwien, 3799 n yixefawen i tennul tawla n Malġa (3592 n tġeġġten akġed 207 n wulli) i yettwajerden deg useġġas 2006 anda 3796 i iruġen ar tmeġliwt [17]. ġer yizgaren, tilin deg sirum n yidammen n tġeġġiwin yeġsean tawla n Malġa tewweġġ 26,3% [18]. Rnu ġef waya, *Brucella* tetteġwakkes-d deg uyeġġki n tfunast [19]. Amġan n teġġrutin timaynutin n yiġersiwien d yimdanen kifkif-it, d ayeġn i d-ibegnen taseġqit n uġwin n yiġersiwien ġef tdawsa tazayezt. D aġġen, tġġrutin timaynutin n yimdanen zemrent ad d-begnent addad neġ timella n

tidet n waṭṭan-a ɣer yiɣersiw n [17]. Rnu-yas daɣen, tawla n Malṭa tettkemmil txeḍdem ugar ameqqran i tdamsa n yifellaḥen, amedya d timezliwt n yixefawen i yesēan aṭṭan-a u daɣen d ssebba n unṭaḍ ɣer yimdanen di Lezzayer. Amagrad-a ad d-isken addad n yimukan d tmusniwin ɣef tawla n Malṭa n yimdanen d yiɣersiw n di Lezzayer akken ad nri ad d-nbeggen u anegzu akken iwata timella n tura u ad nesleḍ imgan izemren ad snernin anṭaḍ n waṭṭan-a gar uɣersiw d umdan.

Tabadut, beṭṭu d umezruy n tawla n Malṭa

Tabadut

Tawla n Malṭa d aṭṭan ineṭṭden deg uɣersiw ar umdan i d-txeḍdem tbaktirit, tettuear i usejji, yettaḍen-itt umdan akked uɣersiw [20,21]. Aṭas n ccetlat n tbaktiriyin i tt-id-ixedmen, tid ittekkkin ar tewsit n *Brucella* [22]. Tawla n Malṭa mazal-itt gar waṭṭanen ineṭṭden aṭas deg umaḍal [23]. D Lezzayer, d aṭṭan n tseyrut tamarant aya d ayen ittujerden di tanaḍt U° 95-66 n 1995 [24]. Zik tamsalmit-a tesēa ugar n yismawen: tawla n wagrakal, tawla n Malṭa, tawla n jibraltar, akked tawla yettbeddilen, di taɣult tussnant, zik semman-as « Brusiluz, Brucellose » [4].

Amezruy d beṭṭu

Anmahal n teftakt deg tegrasawit tageldant n tujja deg Tgelda Idduklen, Jeffery Allen Marston, d netta i d amezwaru i d-yemmeslayen ɣef tawla n Malṭa » d tawla n uradus n wagrakal » deg 1981 deg udasil-ines deg tmurt n Malṭa [25 deg 26,27].

Deg useggas n 1884, ameftak lqebṭan David Bruce (1855–1931) (Tugna 1) yewweḍ ɣer tegzirt n Malṭa. Deg tegzirt-nni, Sir David Bruce yiglem-d aṭṭan ixeddmen tawla yessalayan lḥamu n imuḍan deg id ɣer 41°C i d-yettsubbun deg uzal. Tawla-agi tettyimi aṭas n ledwar, tikwal d ayyuren, tikwal daɣen tneq imuḍan [29].

Deg 1887, yella d lqebṭan u d amejjay ar yiserdasen n tgelda: Bruce ikkes-d tubbit n uksum deg uḍiḥan, tasa akked tgezḗzal n yiserdasen igliziyen yuḍnen yemmuten yellan di Malṭa, yufad taɣawsa tamuddirt iwumi isemma « *Micrococcus melitensis* ». Ikkes-itt-id deg uḍiḥan n semmus (5) n yiserdasen yemmuten s tawla n Malṭa, i tikelt tamenzut ibeggen-d anwa i d ssebba n waṭṭan-a, isyin akkin uɣalen semman-as « *Brucella melitensis* » ɣef yisem-is, yefka-yas isem-a Meyer akked Caw. Bruce iwala dakken « *Micrococcus* » yesēa 3 μm di teɣzi, d ubrin ittak anzi ɣer tbaktiriyin n Gram ibaw. Iwakken ad d-yesbin akken d ssebba n temsalmit-a, Bruce yessenṭeḍ i yibkan s wayen d-ikkas deg yiserdasen yemmuten i d-isnerna deg tnaramt s uṣebbi. Ṣa (7) n yibkan uḍnen u ukuz (4) mmuten, kraḍ-nni yeqqimen ddren maca s tawla tikwal tettiḡhid tikwal tettenqas am tinna i walan ɣer yimdanen. Bruce seld mi d-ikkas tubbit deg uksum n yibkan yemmuten, yuɣal isenker-d deg tnaramt amikrukukus, aya yekkes-it-id deg igmanen-nsen [30 deg 26,27,29,31,32].



TUGNA 1. David Bruce. D win i d-yufan *Brucella melitensis* (brucellose) [28].

Deg 1895/1897, amejjay n yiɣersiw n tmurt n Danmark Bernhard Lauritz Frederik Bang (Tugna 2) yekkes-d taɣawsa tamuddirt iwumi isemma *Bacillus abortus*, deg umgun, tarɣudin akked waman yellan sdaxel n tarɣudin mi ɣrint aṭas n tsita deg unṭaḍ n temsalmit [34 deg 27,35,36], Petruvič d Cvetnič, 2017 *asaru n usarag: amaḍal d tussna n twennaḍt, tawla n Malṭa-izri, amha, imal* 2017; 85: 012019. IOP asuffey, [37]]. Deg 1897, Wright d Smith begnen-d dakken tawla n Malṭa d aṭṭan ineṭṭden imi i d-ufan untikuren (mgal tafekka) n *Brucella melitensis* deg useyyi n unenṭaḍ i d-iḍerrun deg yidammen n yimdanen akked yiɣersiw n [38 deg 27].

Ass n 23 ctember 1905, iruḥ uɣerrabu deg Malṭa ar Nyu Yurk yewwi 60 n tɣeṭṭen. Taqedḍiwt-nni erran-tt weḥd-s acku aṭas i yemmuten deg yinig. Iɣallen yetṭfen ayerrabu, amasay n usikel i yellan d axeddamm deg lbiru n temguri n iɣersiw n tmurt n Marikan, akked yiwet n tmeṭṭut iswan ayefki n yiwet n taɣaṭ i d-irewlen deg uɣerrabu sbanen-d akk iskanen n tawla n wagrakal. David Bruce iwelleh iɣallen n laman di Marikan ɣef waṭṭan n wagrakal i zemrent ad awint tɣeṭṭen n tmurt n Malṭa. Deg yiwen useggas (1905), Themistocles Zammit, ayerman n Malṭa u d aeggal n tesqamut tussnant n tawla n wagrakal anda Bruce yella d imḍebber-is, ufan-d dakken ssebba tamezwarut n waṭṭan-a d ayefki n taɣaṭ, deg useggas n 1906 zlan akk tiɣeṭṭen-nni i d-wwin deg tmurt n Malṭa [29,32].



TUGNA 2. Bernhard Lauritz Frederik Bang [33].

Tawla n Malġa d tamsalmit i yellan deg umaġal akked yimenżawen akk, ladya di tmura gar teftisin n yillel agrakal, deg tzunegzirt n Waeraben, deg Marikan talemmast d ugafa, di tmurt n Miksik d Lhend. Aġġan-a yettnal di tuget timura tiżawaliyin i mazal seant anegrif ar tura s lehlak-agi. Di tmura tinesbaġurin aġġan-a yettwakkes ar yiġersiwien [32,34,39,40 deg 27].

Brusiluz ney tawla n Malġa n yimdanen d yiġersiwien tettjerred seg zik di Tefriqt, asnagar n waġġan-a di tmura n Tefriqt Ugafa ur d-ittak ara tidet acku ulac tizrawin iŧeħħan u dayen addad n waġġan ur xdimen ara aġas fell-as tizrawin tussnanin [17]. Tawla n Malġa ħer yimdanen ufan-tt-id yakan i Lezzayer deg usegġas n 1895 deg usaday Pasteur n Lezzayer [41]. Deg 1982, assaħ n Ugraw n Tmura Idduklen di tgella akked tfellaħt (FAO) ħef tawla n Malġa di tmura n usammer ibeggen-d dakken tilin n waġġan-a n tbaktirit *Brucella melitensis* ur tban ara nezzeh, di Lezzayer, Lmeħħuk d Libya, xas ulamma deg wakud ħer wayeġd ttilin-d yimeġqan anda i yella win i tt-yettaġn swa imdanen ney tiġeħħen di tmurt n Tunes [42 deg Benhabiles d al., 1992 allal

n temlilit tagraħlant: aħader seg tawla n Malġa di tmura n wagrakal, [17].

Xas akka, tasusmi n waġġan ur teqqim ara aġas tuħal-d, deg uzgen n usegġas n 1980 arma d asegġas n 1990, yettjjerred dakken yennerna waġġan di tmura n Tefriqt Ugafa am Lezzayer [Benhabiles d al., 1992 allal n temlilit tagraħlant: aħader seg tawla n Malġa di tmura n wagrakal], iħallen yettħen tadawsa nebbhen-d ħef waġġan i izemren yella ur s-faqen ara [17]. Aya nwala-t deg unfafad i yewwten tamdint n Tyerdayt deg 1984, anda 600 n liħalat i d-ufan, tamuħli syin akkin twelleħ ħer waġġan-a. Seld Tyerdayt, aġġan-a ufan-t-id i temnaġin nniġen, am temdint n Tlemsan (1986) akked temnaġt n ŧiħ (1989). Uġġi n ufermaj ney aguglu d netta i d ssebba tameqqrant n temsalmit-agi [Benhabiles d al., 1992 allal n temlilit tagraħlant: aħader seg tawla n Malġa di tmura n wagrakal; [43 deg 41]. Tiffin n tawla n Malġa n yizgaren deg yidammen di Lezzayer 1969-1976 tbeġgen-d aktamur i yellan gar 12% [44]. Deg 1986-1989, amur n wulli akked tħeħħen yesen tabaktirit ney seġddan aġġan-a yella s uġfar di 2,18% ar 12,0%. Maca ilaq ad nħer aktamur n tħeġħiwin n wulli akked tħeħħen yesen tamsalmit-agi illa gar 43,5% ar 42% [41].

Tawla n Malġa ħer umdan tbeddu s temsalmit taruradt, tettbeddil, tezmer ad tuħal d tin yezġan s waħas n tmukrisin [22]. Ar umġan, ugar n 500 000 n teħrutin timaynutin yal asegġas u imeskaren zġan ttawin-ten-id, maca ayen illan di tidet n teħrutin timaynutin illa ugar ħef wayen nseħl: tuget n tmura yennul waġġan-a d timura ur nesħi ara ttawilat n usenneħru u dayen aħal n limarat i tesħa temsalmit n tawla n Malġa, imi ttemcabin akk yiskanen-is isħel ad tħeħħeġd akked temsalmiyin ixeddmen tawla [22]. Tabaktirit-agi tezmer ad texdem tamsalmit n texħifin akked tħeħħert ar umdan [13–15]. Tamsalmit ħer yizgaren tesħa azal di tdamsa n tmetti meqqren [22]. Aġġan-a yettnal tanezzut n yiħersiwien akked yifuras i d-yusan seg-sen [9], irennu yesseħlay tuħza n uyeħki, timezħiwt n yizgaren isen tabaktirit deg yidammen-nseħ, tħeħħert, aħraħ deg ukraġyur anegħaru n tadist [2,5–8].

Tulmist n tbaktirit i d-ixeddmen aġġan-a

Tibaktiriyin n *Brucella* d tibelyezfanin n Gram ibaw, asket-nseħt 0,6–1,5 μm di teħzi d 0,5–0,7 μm di tehri [45]. Taħħelt tameħħuħt n unerni d 34 °C. Aħħebbi n tbaktiriyin n *Brucella* yettili iħerrez daxel n yinagrawen n uħħebbi s yidammen acku isenqas akud n tsuta n yimikruben-agi [46]. *Brucella* d tibaktiriyin yettidiren kan anda yella uzwu, kaħalaz ilaw, Uksidaz ilaw [45]. Tuget n cħetlat i d-yettwakksen deg waġġanen n yimdanen xeddment-d Uriħaz. ħef tħedmirt tasnudrant d takrudant ur d-nettban ara akken iwata, tiffin n tbaktiriyin-agi iħħer s tarrayin sħexdamen yal ass. Yerna, aseħħec n wallalen n tiffin n tawsit API-NE tikħwal isseħħeħħi i tiffin n

Moraxella phenyl pyruvica [47]. Ajinum n csetla *B. Melitensis* l6M, isea sin ikrumuzumen ubrinen n l,15 ar 2,1 Mb [48]. Tuddsa-yagi nettaf-itt deg tuget n csetlat, anagar tin n *B. suis* biovar 3 i yesean yiwen n ukrumuzum ubrin n 3,2 Mb [48].

Aybalu, iberdan n untađ d usenđed n wařtan

Tawla n Malřa d ařtan n yiřersiwen send ad yili d ařtan n lmal ttrebbin (izgaren, ulli, tiyeřten) u d aewin n temsalmit ar umdan [45]. Iřersiwen iwehřciyen tarandus, tizerzert mm tqacuct, aramul n umadař, aramul n yideflawen ttilin d ssebba n wařtan deg kra n yimđiqen deg umađal [49]. Kra n csetlat n *Brucella* zemrent ad nalent kra n yisuřtađ n yilel [50]. Tella tmuzzegt n inebgi i yal csetla maca maćči d asađuf: *B. melitensis* tessenfufud ulli d tyeřten, *B. abortus* d nettat i yeqwan ar yizgaren, *B. suis* d imezli i yilfan. Iřersiwen-a ttađnen ařtan yettuřalen yezga s umata u ttđeggiren-d tibaktiriyin i twenađt am umgun ma yeřri-d, ayefki ar testan, ibeccan d leřbar [51].

Amdan yettařraf-d tawla n Malřa

Yezmer ad yili s ubrid arusrid deg uebbuđ-is ma yećća tagella neř ifuras n uyeřki (ayefki ur yepasturizin ara d yifuras i d-yeřkan deg-s ma ur wwin ara), d tkerciwin ur newwi ara akken iwata neř asnuffes n uzwu akked takka yesean tibaktiriyin. Yezmer ad yili s ubrid usrid s uglim mi ara yennal imeđqan am yisirew (amejray n yiřersiwen, afellař, ixeddamen n yisezlayen, wid yettummun, ...) n lmal yuđnen, amgun mi ara teřri tfunast, tarřudin, aman i d-yettekken deg ddwaxel, tussut am uhicur i ttessun i lmal llant deg-s tbaktiriyin d ssebba n untađ. Antađ izmer dařen ad yili s usnuffes neř deg wallen [51,52]. Amdan ur yessentađ ara i umdan. Aseđdi n tbaktirit ar umdan d uktaur n temsalmit deg umađal qqnen řer tannumi di tgella, d wamek ttrebbin lmal d tmella tadawsant deg umđiq-nni [52]. Tamsalmit i d-ittekken deg izerman teqwa deg tmura anda apasturizi n uyeřki ur yelli ara [50]. Di tmura-yagi antađ yettuřal d tasakrart di temdinin anda ur myagaren ara lřaci d yiřersiwen yuđnen [53]. Antađ deg tnarment n tesnudert (imesnuddiren, imaz-zagen n tnaremt) d ssebba tameqqrant n lehlak mi ara ttalen tihras n *Brucella* (acku tihras n *Brucella* zemrent ad ddunt deg uzwu) neř mi ara ttalen tagezzayt n yiřersiwen ar yimejrayen yiřersiwen d yifellařen [51].

Iskanen d tfidiwin řer umdan d uęersi

Tazwara n temsalmit ar umdan tezmer ad d-tbin s kra n iskanen ur ttwaęqalen ara, izmer ad tēddi war ma ifaq-as. Tamsalmit tezmer ad teqqim d tasusamt kra n wayyuren, tikwal kra n

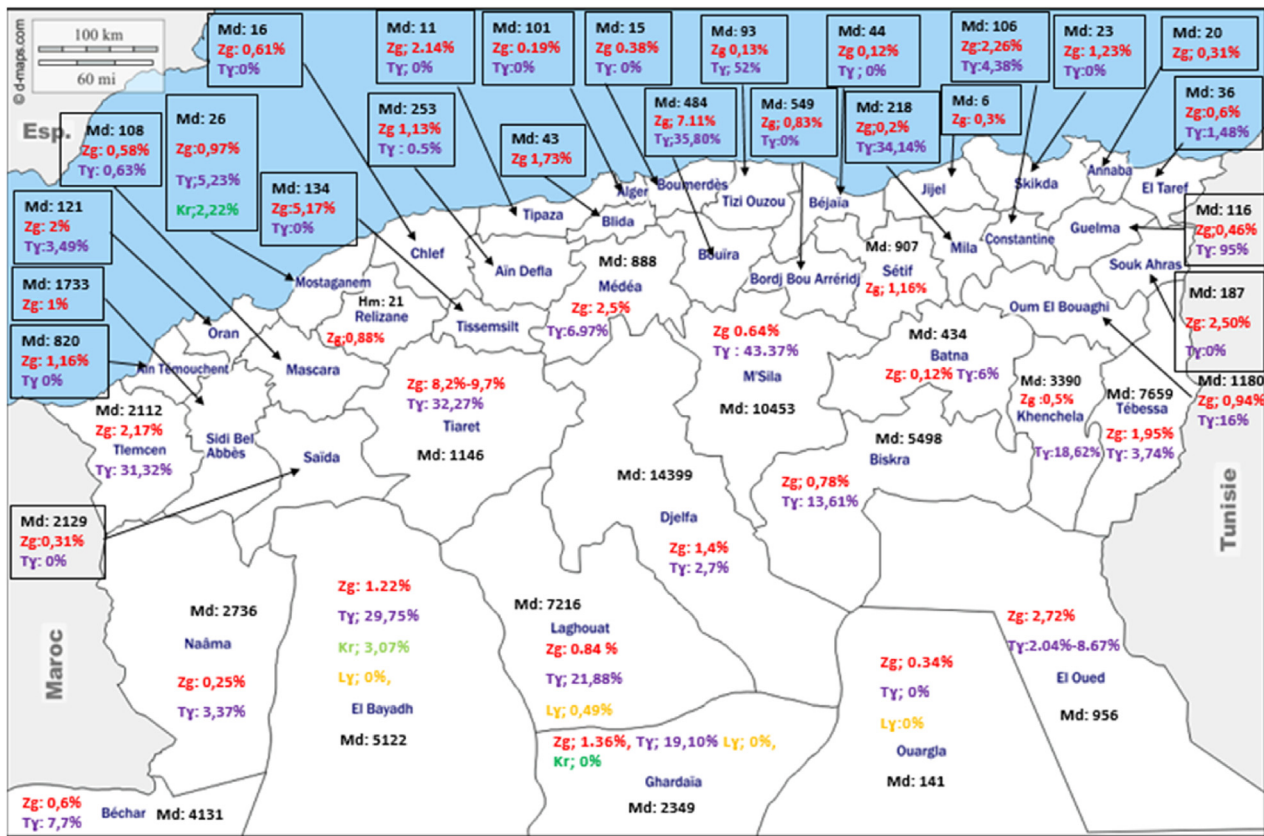
yiseggasen, tettaki-d ma yella umdan yuđen s wařtan nniđen neř tenqes tezmert-is. Tiřimit n tbaktirit deg tfekka deg tazwara n temsalmit tetteřtil gar kra n wussan d wayyur. Ařtan imir-nni ar umdan ittan-d s kra n yiskanen ur nettwaęqal ara am tawla d tusut ittellař arma d tamsalmit n texlafin, ad bezgent akk, d ubzag n yiwetman, abzag n wadiř d yizuran deg uęerruy. Ma ur tdawa ara, tawla n Malřa tettuřal d ařtan yezgan anda txeđdem abzag lađřa deg texlifin [53,54].

Ar yiřersiwen, ařtan di tuget ur yeweir ara, aęersi w yuđnen yesbanay-d kan kra n yiskanen [Mtwi-Malamca, 2001. Aęemmir. řanzanya: Tasdawit řukwin n Tfellařt; Tazrawt tussna n wařtanen n Tawla n Malřa řer yimdanen d yiřersiwen di Babati d temnađt n Hanang i řanzanya akked James LW 2012. Aęemmir. řanzanya: Tasdawit řukwin n Tfellařt; Tussna n wařtanen n yimdanen n tawla n Malřa deg Usamar-Muřuguru, řanzanya]. Maca tesseřray tistan, tettiweir tuřfa deg ttemkina d tarrawt. Di tuget, yiřersiwen řellun, arnu tafunast yeřrin tettuřal tettarew, maca zemren ad ttđeggiren tibaktiriyin [55]. Di ssebba n usruřu adamsan meqqren (ařray, řelluy n tuřza n uyeřki d yifuras-is) i yifellařen n testan tuřza, n wulli, d tyeřten akked yilfan [56].

Timella d unerni n tawla n Malřa řer yimdanen d yiřersiwen di Lezzayer

NB: řef teřrutin n yimdanen d tid yellan gar 2000 d 2015 [Buferkas d al., 2019. Asenfař n taggara n tezrawin deg usuday n tuijya n yiřersiwen di tesdawit n Blida, tazrawt tamaqqalt řef tawla n Malřa n yimdanen di Lezzayer].

řef wayen i d-tenna tneřlaft n tdawsa, n uęřef d tesmeskelt n řřbiřarat (TTUTř) [60], tajřut talemast (tajřut/100 000 imezday) n tawla n Malřa řer umdan tella gar 7.37 di temnađt Talemast- Agafa, 9.89 deg Ugafa-Asamar, 4.67 Agafa-Amalu, 18.26 di tneřruft akked 65.87 di temnađt n uzawař [60 deg 61]. Timella n tawla n Malřa tbeĝgen-d d akken amđan n teřrutin yeqwa deg temnađt n uzawař mi ara nmuqqel ar temnađin nniđen am temnađin yellan řef yiri n yilel (Tugna 3). Gar řa n lwilayat i ijeřden ugar n 4000 n teřrutin n tawla n Malřa n yimdanen deg useggas n 2000 ar 2015: semmus llant deg temnađt n uzawař, am řelfa (14399 teřrutin), Msila (10453 n teřrutin), Tbessa (7659 n teřrutin), Leřwař (7216 n teřrutin) d Lbeyyeđ (5122 n teřrutin) akked snat n lwilayat Beccař (4131 n teřrutin) d Beskra (5498 n teřrutin) [Asuday Aęelnaw n Tdawsa Tazayezt deg Buferkas d al., 2019. Asenfař n taggara n tezrawt deg usuday n tussniwin n tuijya n iřersiwen. Tasdawit n Blida; Tazrawt n ubgan n tawla n Malřa n yimdanen i Lezzayer]. Amđan-a meqqren deg temnađin n uzawař ssebba-s yeqwa deg-sent uřebbi n yiřersiwen imećtař yettaran ifeř deg teřzutin-agi [61]. Tamnađt n yignan unnigen n Lezzayer d yimeđqan n



TUGNA 3. Imeđqan anda tella tawla n Malța n yimdanen d yięersiwen di Lezzayer 2000-2017 [57,58] Rezzag d Benmexluf, 2017, takatut n Majistir di tesdawit n watmaten Menturi di Qessenřina-asuday n tuijya n yięersiwen, abzar i tezrawt n usnagar d yimeđqan anda ttilin wařřanen ięejdanen n yizgaren i ilaq uberreh fell-asen di lwilaya n Suq Hras, 18 Sidhum-Reccidi d Neyyar, 2019 agemmir n duktura, tasdawit n Msetyanem; tasestant ęef tussna n wařřan n yimdanen d yięersiwen, n lwilaya n Msetyanem, Mwatař d al., 2016. Asenfař n taggara n tezrawt, asuday n tuijya n yięersiwen. Tasdawit n Blida; tilin deg sirum n tawla n Malța deg temnađt n Leywař, Ğelfa, Taęerdayt, Lbeyyed akked Wargla; Munęi d Deřmani, 2018. Asenfař n taggara n tezrawt. Asuday n tuijya n yięersiwen. Tasdawit n Blida. Tasestant tamaqqalt ęef tawla n Malța n yimdanen d yięersiwen deg temnađt n Tubiret, [59], Remdani 2017. Takatut n Majistir. Aęerbaz aęelnaw unnig n tuijya n yięersiwen n Lezzayer; tawla n Malța deg tqeđęiwin n twaculin deg temnađt n Lwad: tazrawt ęef tussna n wařřan d usenęeđ, Aggad d al. 2004. Takatut n duktura. Tazeddayt n tussna, agezdu n tesnudert. Tasdawit n Wahran (Sanya); tasestant ęef tussna n wařřan n Malța n yimdanen d yięersiwen di Lezzayer].(Md: amdan, Zg: Izgaren, Ty: Tięeřřen, Kr: Akraren, Ly: Alyem).

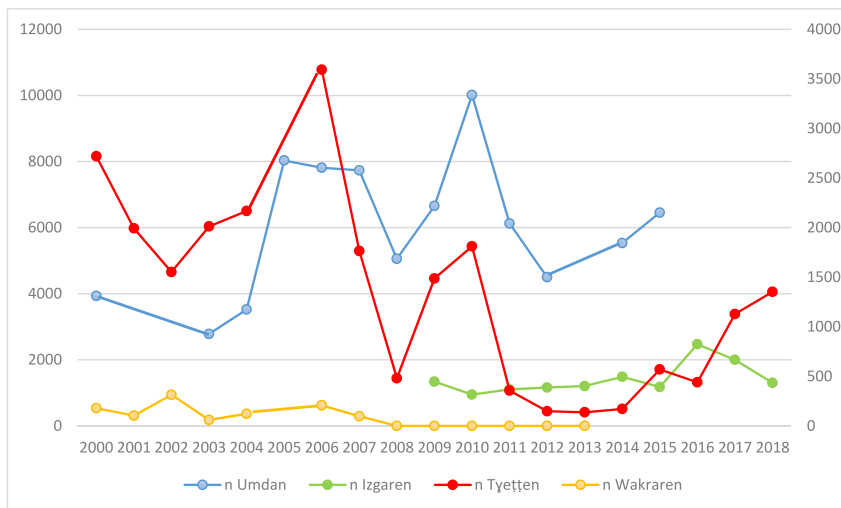
tkessawt d wuđči, imi kessen deg-s akka 16.8 yimelyan n yięu-liyen d 1.6 n umelyun n tęeřřen azal n 3 ar 4 wayyuren deg useggas (tafsut). Daęen i temnađt-agi, azal n 7.5 yimelyan n yimdanen i izedęen deg-s, gar-asen 10% d imgalaten [62 deg 63]. Tilin deg sirum n tawla n Malța n yimdanen i d-wwin deg temnađt n uzawaę (Lbeyyed) (113 tejrutin/100 000 yimezday) [64] tęedda ugar ęef wayen i d-iwwi Usuday aęelnaw n tdawsa tazayezt deg 2009 ęer uęref amagnu (19,4 tejrutin/100 000 yimezday) [65 in 63].

B. melitensis biovar 3 d nettat i ixedmen tawaęit deg tejrutin n yimdanen deg tmura n wagrakal [9,17,61]. Deg temnađt n uzawaę, biovar 3 yettwakkes-d yakan deg temdint n Tyaret deg uyefki n tfunast akked idammen n umdan [18] u yella daęen d ssebba tameqqrant n uęray n tęeřřen i d-tęeddem tawla n Malța deg Batna d řřif [63]. Tazrawt tetwaxdem iwakken ad

afen ižuran n tbaktiriyin yellan di Tefriqt Ugařa n *B. melitensis* biovar 3 iwakken ad nadin ma yella wassaę d ižuran n Tuřupt. Tazrawt-a tbeĝgen-d dakken ižuran n tbaktiriyin di Lezzayer d tid n Tuřupt tteyyagarent (agraw n lezzayer yeqqen akked udugraw n Tuřupt). Aya d inigi belli tella tbaktirit seg zik, d assaę daęen yellan deg umezruy gar Lezzayer d Tuřupt [17].

Anerni n tawla n Malța n yimdanen d yięersiwen di Lezzayer

Tawla n Malța n yimdanen. Di Lezzayer, tejrutin n tawla n Malța tbeĝgen-d anerni, s tegnutin yellan gar 0,36 deg 1989 arma d 23–24,6 deg 2005–2007. Deg wakud n umrawseggas, tejrut tennerna seg 15 ar 28 i 100 000 yimezday deg useggas n 2000 ar 2010 s uđfar [17]. Anerni n wuřřun n tejrutin timaynutin n yimdanen i yettujen d kifkif-itt ar winna nwala ar tęeřřen



TUGNA 4. anerni n tawla n Małta n yimdanen d yiwersiwen di Lezzayer 2000-2018 [Buferka d al. Asenfař n taggara n tezrawin, asuday n tujjya n yiwersiwen, tasdawit n Blida, tazrawt tamaqqalt n tawla n Małta n yimdanen di Lezzayer akked Ammi d al.,2019. Asenfař n taggara n tezrawin, asuday n tujjya n yiwersiwen, tasdawit n Blida; tazrawt tamaqqalt n tawla n Małta n yizgaren d tyeřten di Lezzayer, [17]. Isefkan ulac-iten: Amdan (2001, 2002, 2013), Izgaren (2000-2008), Tyetten (2005) akked Wakraen (2005).

(Tugna 4), tamuřli-yagi teskan-d udem amihan n tidet n uęwin yiwersiwen, ladřa tyeřten, řef tdawsa tazayezt [61].

Tawla n Małta n yizgaren. Asileř ařayer adawsan n tawla n Małta n yiwersiwen d ayen nwala seg wasmi xedmen ahil n usnefren n tawla n Małta anda aktamur ięedda s uđfar deg 5% ar 0,76% di tlemmast n yiseggasen 90 d 2014. Maca asileř-agi n takza d usnefren ixuř imi ur nnulen ara siwa 6% n tqeđęiwin n yizgaren di Lezzayer [66 deg 61] rnu ařayer n wazal n 94% n usemday n yiwersiwen yettarran ifeř ulac win l t-yeřran, d aya i d ssebba n untađ i yiwersiwen nniđen akked umdan. Tirzi n wahil-agi tesęa ařas n ssebbat, am temřer n wakal n Lezzayer, nnexřař n ttawilat n umesni i terbaęt n tujjya n lmal ixedmen asnefren i lmal deg tudrin akked teřmar timřiziyin d uktaur mečtuřen n umhis ur nęedda ara 50% [61].

Tawla n Małta řer yiwersiwen imečtař, ulli d tyeřten. S uřrud n 31 483 680 n wulli d tyeřten, třeřbga n yiwersiwen imečtař yettarran ifeř d agzum ameqqaran n ufares. Třeřbga n snat-agi n cęetlat ttwehin-tent i uksum d uyeřki ladřa i uguglu feta [61].

Tawla n Małta n wulli d tyeřten txeđdem-itt-id *Brucella melitensis*, ařtan akk iweęren ittenařađen i yellan d amihi i tdawsa tazayezt. Aheęgi n ttawilat n usefren, timezliwt d uqđaę n wařtan-a d ayen i texdem tnebdalt n tujjya n lmal deg wařas n tmura [61]. Ula di Lezzayer ahil am winna xedmen deg tmura nniđen yebda seg 1995, maca yegguma ad isufeř tawla n Małta ar wulli d tyeřten, imi yal wa amek neř anda itřeřbbi lmal-is [61]. Deg useggas n 2002, seld řa yiseggasen segmi yella wahil asefren-timezliwt, ařlif n tfeřlařt d unegmu afaran (ATUA) yexdem tasestant akken ad d-yaf ačal n teřrutin yellan s tawla n Małta řer wulli d tyeřten, agemmuđ ibeggen-d dakken tijřutin tiřel-nawin n tqeđęiwin 5,68 %, tijřutin n tqeđęiwin ięedda 10% deg

temnađin n uzaway [61]. Timella-yagi tesseřrec awanek azzayri akken ad iheęgi ahil n tecrađ n wulli d tyeřten i temnađt n uzaway s tgezzayt Rev-I, u ad ikemmel deg wahil n usefren-timezliwt deg temnađin nniđen [66 deg 61].

Gar 2006 d 2013, ticrađ tennul 67% n wakal ařelnaw (32/48 n lwilayat) anda ařrud n 21 036 314 n wulli d tyeřten ttwa-ęeręent. D ayen isneqsen čiř tajřut n temsalmit-agi deg tqeđęiwin n wulli d tyeřten ar 3,33% deg 2014 [67,61]. Dayen tazrawt [Keręaę d ben Mahdi, 2014. Isemduyen n Tawla n Małta Rev-I, n tecrađ deg allen n wulli d tyeřten řef tawla n małta n yimdanen deg imđiqen unnigen di Lezzayer. Anyir. Immunul. Agzul n usarag: agraw amenzu agrayřan n tussna n tifeřkemingalin d tussna n wařtan s tussna n tifeřkemingalin taęeclawant] tesken-d čiř n usileř deg waddad adawsan ar snat n cęetlat-agi deg temnađin n uzaway u aya seld řam yiseggasen mi yebda ucrađ s Rev-I deg 2006. Ahil n tecrađ d uqđaę i yettwaxedmen ibeggen-d dakken inęes wařtan-a, aya yewwi-it-id Gabli et al., 2015 [63] deg tezrawt i yexdem anda i d-isken tajřut n 15,84% deg temnađin ur necriđ ara [61].

Amgi n useņeđ n tawla n Małta řer umdan d uęersiww di tmurt n Lezzayer

Aflali n tawla n Małta ar yimdanen tbedd řef wařas n ssebbat am tarrayt n třeřbga, teřdeg n twennađt, tarrayt n useřdem n uyeřki d tannumi di tgella: am tuččiř n yifuras n uksum ur newwi ara akken iwata d tissit n uyeřki ur nepasturizi ara [68]. Xas ulamma llant tuffyiwin n useęzi d uřader, tinnuma deg tgella mazal-itent, am yimeđqan imagamen, anda imdanen zedřen s wassař akked yiwersiwen [17]; tuęet (89 %) n yimdanen i yuđnen tawla n Małta

swan ayefki ur newwi ara ney yifuras-is, i tuget deg tefsut imi d akud n tarrawt n tsita d tyejten akked 5,4 % uċnen aġġan-a mi ttarwen yiġersiwien-agi [18]. Di Lezzayer, aħric n tejrutin, yellan 10%, d imsudar i yettaċċnen maca 20% n tejrutin yekka-d deg waġas n tyaŋsiwin [69 deg 61].

Yeġ wakkeni d-tbeggan tdaddant n AATT (2009), aġġan-a nettmagar-it ugar ħer irgazen wala tilawin, aya yezmer yeqqen ħer twuri imi d irgazen i yeqwan deg taġult n tdawsa. Maca anġaċ i d-yettasen deg tgella d tulawin iwumi yettentat yeġ yirgazen. Aya nezmer ad t-id-nessegzi d akken d tulawin i yettnalen aġas ifuras n tgella yeġ urgaz. Ma d ayen yecnan lemer, aġġan-a yettnal akk deg umeċġuħ ar umeqran, maca d imengaċen i yettnal nezzeh [69 deg 61].

Tamgalta d ubeddel n umċiq n tnezdut d askar n tudert, imdanen ttbeddilen imukan n tqeċċiwin-nsen d yiman-nsen, daymi i yeweer ad xedmen dinna ameġlu n tdawsa, aya d ayen irennun i uflali d usenufed n waġġanen ittezgaren deg uyersiw ar umdan am tawla n Malta. Tijrutin iġehden ar uħref amgalat nezmer ad tent-id-nessegzi seg yidles-nsen, tannumi d wansayen seħan imi tessan ayefki ur newwi ara akked yifuras n uyeġki. Tuċcit n uksum ur newwi ara (tasa d uċiħan) d uttekki n twacult irkel di tmezliwt d ayen i ten-yettaġġan ttalnen aksum azegzaw (ur newwi ara) akken dayen ttalnen idammen yeseħan tabaktirit n temsalmit-a aya ittekki deg unġaċ [63].

Taseqqit tadamsant n Tawla n Malta n yiġersiwien d yemdanen di Lezzayer

Di Lezzayer, tawla n Malta tesħa agutu azayez n l 897 288 EUR [Akakpo d al., 2009. Taseqqit n tawla n Malta yeġ tdamsa akked tdawsa tazayezt di Tefriqt. Asarag OIE, 71-84], azal n usruħu adamsan ines i yellan deg umrawseggas seg 2004 arma 2013 deg wahil n ubellen akked usefqed yewweċ 2 imelyaren n dinaħ [Benbetka ġara d Cebrek Wisam, 2015. Asenfaħ n taggara n tezrawin-Agzul. Aħerbaz aħelnaw unnig n tujja n yiġersiwien-Lezzayer. Tazrawt yeġ wazal n tawla n Malta di Lezzayer]. Gar isemda iġejdanen n waġġan-agi yeġ tqeċċiwin, asismel amnusruy yeġ wakken tella tazayt-is yettwaxdem-d: aħider n tużġa n uyeġki, anerni n wakud gar tarewt d tayeċ, tiħriwin, tamettant n yimeċħaħ, izeggalen akked isemda nniċen [Akakpo d al., 2009. Taseqqit n tawla n Malta yeġ tdamsa akked tdawsa tazayezt di Tefriqt. Asarag OIE, 71-84]. Ĥer wemdan, ssuma n usejji n yimuċdan yuċnen tawla n Malta yewweċ 650 EUR [Akakpo d al., 2009. Taseqqit n tawla n Malta yeġ tdamsa akked tdawsa tazayezt di Tefriqt. Asarag OIE, 71-84]. Deg tallit gar 2002 d 2013, azal n 80 imelyan n dinaħ i tewweċ tawla n Malta n yimdanen [Benbetka ġara d Cebrek Wisam, 2015. Asenfaħ n taggara n tezrawin-Agzul. Aħerbaz aħelnaw unnig n tujja n yiġersiwien-Lezzayer. Tazrawt yeġ wazal n tawla n Malta di Lezzayer].

Taggrayt d tmezri

Tawla n Malta mazal-itt d aġġan amaċlan. Timukrisin yeqqnen d tamumt i umdan, u d ssebba n usruħu meqqren i tdamsa am lmal. Di tesyunt-agi, nwala dakken di Lezzayer anerni n waġġan ar umdan akked yiġersiwien am tyejten ur yerkid ara ladya deg 20 yiseggasen-agi ineggura. Deg yiseggasen i d-iteddun iwakken ad yader waġġan, ahil n tukksa n waġġan i yellan akka tura ilaq ad yennerni, u aya ibedd yeġ tfin akked usnefren n tqeċċiwt taħelnawt n yiġersiwien. Akked tseyrut n tejrutin tufiririn n yimdanen d lmal, asennefru di tazwara, xas ulamma yeweer imi iskanen-is mgaraden, n tmellilt n wallalen n usennefru am wid n tnaramt, aderreeħ n wahil « asnefren-tmezliwt » ara yennalen ugar iyersiwien d unerni n uktamur n uħram i yifellaħen. Dayen, ilaq tisestanin deg unnar iwakken ad d-afen agerrum i ixedmen aġġan-a iwakken tagezzayt swayes ara cerċen ad tili d tin iwulmen u d tin ara sxedmen i tqeċċiwt taħelnawt akk. Asizzel iwakken ad rren di ddehn n yimdanen s usegzi n umiħi n kra n tillalin sexdamen yal ass am tissit n uyeġki ur newwi ara akked yifuras-is ilaq ad yili.

Aġġan-agi ittentat den deg lmal ar umdan ad yeqqim ma yella uewin n yiġersiwien ur yettusenqed ara. Aċċaf akked uħader yeġ tawla n Malta n yimdanen yeqqen ħer usenqed d uħader yeġ tawla n Malta ħer yiġersiwien, i yellan d aewin n *Brucella spp.*

Yeġ tedrimt

Ulaħ win d-yefkan tadrimt iwakken ad nexdem tazrawt-a.

Tiwi n yimeskaren

F.T. akked V.G. uran aħris agejdan n warusfus. F.T. ixdem-d tasnarrayt u yerra-d tugniwin. K. Σ. yura-d u isuqqel-d ħer tmaziħt. Yakk imeskaren ħran arusfus-agi.

Tħrad yeġ urusfus-agi

Imeskaren nnan-d dakken ulaħ amennuħ gar-asen.

Asnemmer

Nukni, imeskaren n tesyunt-agi, ad nesnemmer amaru Mass Ĥusin Luni yeġ useħti n tucċiwin d tyuri n ulqem n taggara n umagrad-agi.

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