**Supplementary**

**Table 1- Predictive equations for 24-hour sodium excretion based on single spot urinary sodium concentrations**

|  |  |  |
| --- | --- | --- |
| Equation | Predictive equation for 24-hour sodium excretion | Reference |
|  | mg |  |
| **INTERSALT (North American)**  Male | *=* 23 × {25.46 + [0.46 × spot Naammol/L)] - [2.75 × spot Crb(mmol/L)] — [0.13 × spot Kc (mmol/L)] + [4.10 ×BMId (kg/m2)] + [0.26 × age (y)]} | (10) |
|  |  |  |
| Female | = 23 × {5.07 + [0.34 × spot Na (mmol/L)] — [2.16 × spotCr (mmol/L)] — [0.09 × spot K (mmol/L)] + [2.39 × BMI (kg/m2)] + [2.35 × age (y)] - [0.03 × age2 (y)]} | (10) |
|  |  |  |
| **Tanaka** |  |  |
| Male and female | = 23 × (21.98 × XNa0.392), where ×Na = [spot Na (mmol/L)/ spot Cr (mg/dL) ×10] × [Pr24hCr (mg/d)]e | (8) |
|  |  |  |
| **Kawasaki** |  |  |
| Male and female | = 23 × (16.3 × XNa0.5), where XNa = [spot Na (mmol/L)/spot Cr (mg/dL) × 10] × [Pr24hCr (mg/d)]f | (9) |
|  |  |  |
|  |  |  |

a Na, Sodium; bCr, creatinine; c K, Potassium; d BMI, Body mass index;

ePr24hCr (mg/d) = [-2.04 × age (y)] + [14.89 × weight (kg)] + [16.14 × height (cm)] - 2244.45.

fPr24hCr (mg/d) for men = [-12.63 × age (y)] + [15.12 × weight (kg)] + [7.39 × height (cm)] - 79.9; Pr24hCr (mg/d) for women = [-4.72 × age (y)] + [8.58 × weight (kg)] + [5.09 × height (cm)] - 74.5.

**Supplemnatray A.1: Spot Low Formula (Iran 1.a)**

x1=sex (1: female, 2: male); x2=age (year); x3=body mass index (Kg/m2); x4=waist to hip ratio; x5= sodium spot (mmol/Lit); x6= potassium spot (mmol/Lit); x7=creatinine spot (mg/dL); x8=Spot acquisition time (1: morning, 2: afternoon, 3: evening); x9: physical activity (Mets); y=predicted 24-hour sodium (mg/day)

The excel macro is available to the interested readers upon request.

y=

4711677539598840064/(3213655774261819\*(exp((260261904797219\*(x2))/2603643534573568 - (2291169767650937\*(x1))/281474976710656 - (5121751441187021232204453274707\*(x3))/10141204801825835211973625643008 - (93283271283447625863\*(x4))/38136481644573360128 - (19483380893749255\*(x5))/5035024383400214528 - (224168855887276775\*(x6))/92801173921596440576 - (15750873594276325\*(x7))/965388801373372416 - (3331019351828333\*(x8))/4503599627370496 + 530330254976514240086776527709717226510934529371/17229312924354316233461745475330976907708596224) + 1)) - 6523212179284832448/(3213655774261819\*(exp((1598231473536313\*(x1))/281474976710656 - (5352939131611751\*(x2))/166633186212708352 + (3782024361846767519371521353721\*(x3))/10141204801825835211973625643008 + (34695387907300837743\*(x4))/9534120411143340032 + (2653399867605345\*(x5))/24206847997116416 - (131906714118042325\*(x6))/11600146740199555072 + (209922867183190775\*(x7))/46338662465921875968 + (7165154409194197\*(x8))/9007199254740992 - 45007467278646187830053018668685624513273825813/1325331763411870479497057344256228992900661248) + 1)) + 17887614672664587648/(3213655774261819\*(exp((4916520979789417\*(x1))/2251799813685248 - (4296050332655707\*(x2))/41658296553177088 + (3724304663403121633820455629795\*(x3))/10141204801825835211973625643008 - (93476895997983857915\*(x4))/19068240822286680064 - (11637982079935205\*(x5))/314689023962513408 + (6861558895023525\*(x6))/1450018342524944384 + (13489368372887825\*(x7))/1930777602746744832 - (3586392154044269\*(x8))/9007199254740992 - 130602859697731374461529549503567472436323030635/17229312924354316233461745475330976907708596224) + 1)) - 9783093883289976384/(3213655774261819\*(exp((7664420480238409\*(x1))/2251799813685248 + (166852167952755\*(x2))/1301821767286784 - (7158238083308954175003649191285\*(x3))/40564819207303340847894502572032 + (59684448897901608725\*(x4))/4767060205571670016 - (4388090631727295\*(x5))/629378047925026816 + (75354893297326975\*(x6))/2900036685049888768 - (188083207232268575\*(x7))/46338662465921875968 - (3161791158943639\*(x8))/1125899906842624 - 759256360106936537801966783702827034591804603091/68917251697417264933846981901323907630834384896) + 1)) - 95664217166265536/(44022681839203\*(exp((697476421241731\*(x1))/562949953421312 - (3231423340760153\*(x2))/20829148276588544 + (3962494972360036110340550536965\*(x3))/162259276829213363391578010288128 - (1221284188727926035\*(x4))/82190693199511552 + (6154856298362945\*(x5))/78672255990628352 - (46642512887619875\*(x6))/1450018342524944384 - (189612460923881075\*(x7))/5792332808240234496 - (887164756300203\*(x8))/562949953421312 + 195899125976372901014363344718171905785426014559/9505827820333415852944411296734332087011639296) + 1)) - 4445682901229834624/(3213655774261819\*(exp((4760101235939389\*(x2))/20829148276588544 - (5718694418807373\*(x1))/562949953421312 - (6836479994848373238871842547389\*(x3))/20282409603651670423947251286016 + (63425778280447362459\*(x4))/19068240822286680064 - (24887890366837855\*(x5))/1258756095850053632 + (7714978669223075\*(x6))/362504585631236096 + (201172327831047875\*(x7))/46338662465921875968 + (7028920771893841\*(x8))/2251799813685248 + 323180277439138859004934608798440259033527311157/34458625848708632466923490950661953815417192448) + 1)) + 6104253433708912544/(3213655774261819\*(exp((2298495019954003\*(x1))/2251799813685248 + (333677245098081\*(x2))/10414574138294272 + (13813793765330798599716763696107\*(x3))/81129638414606681695789005144064 + (27118256420072274775\*(x4))/2383530102785835008 + (10623124941943745\*(x5))/314689023962513408 + (187461825958005725\*(x6))/23200293480399110144 - (50456782922236975\*(x7))/3861555205493489664 + (1381783005805295\*(x8))/2251799813685248 - 2797941999587244248549793918716211432014671719731/137834503394834529867693963802647815261668769792) + 1)) - 10397907893073157632/(3213655774261819\*(exp((4245585786356900727833005421325\*(x3))/10141204801825835211973625643008 - (1126733889826789\*(x2))/5207287069147136 - (2653952692562591\*(x1))/562949953421312 + (16770233246117579729\*(x4))/1191765051392917504 + (11393141020164305\*(x5))/314689023962513408 - (67272682853971325\*(x6))/2900036685049888768 - (215772478041612325\*(x7))/23169331232960937984 + (1839082252173659\*(x8))/4503599627370496 - 22544106604655375847739679228774883924137046419/2461330417764902319065963639332996701101228032) + 1)) + 4335062184570945504/(3213655774261819\*(exp((199449019525721775\*(x6))/185602347843192881152 - (4334993824196847\*(x2))/20829148276588544 - (5198464794594367624810317550533\*(x3))/20282409603651670423947251286016 - (8308221810876306521\*(x4))/297941262848229376 - (28331677208112415\*(x5))/5035024383400214528 - (1251180125625259\*(x1))/1125899906842624 + (191455153672172875\*(x7))/11584665616480468992 - (158133247465885\*(x8))/70368744177664 + 1271623420098505446419877321759326830051695251197/34458625848708632466923490950661953815417192448) + 1)) + 64913949304248320/(3213655774261819\*(exp((25010893776391\*(x1))/281474976710656 + (5874872273160807\*(x2))/20829148276588544 + (443842658407650896506465196571\*(x3))/20282409603651670423947251286016 - (17158127322201411339\*(x4))/4767060205571670016 - (27410896898247145\*(x5))/314689023962513408 - (142398443609605375\*(x6))/2900036685049888768 - (222723800848027225\*(x7))/92677324931843751936 - (3875951902332639\*(x8))/4503599627370496 + 11048366119787287955480432071207538030690664891/4922660835529804638131927278665993402202456064) + 1)) + 3575378972369876339391/3213655774261819000

Note, exp(x)= (2.718281828)x

**Supplemnatray A.2: Spot High Formula (Iran 1.b)**

x1=sex (1: female, 2: male); x2=age (year); x3=body mass index (Kg/m2); x4=waist to hip ratio; x5= sodium spot (mmol/Lit); x6= potassium spot (mmol/Lit); x7=creatinine spot (mg/dL); x8=spot acquisition time (1: morning, 2: afternoon, 3: evening); y=predicted 24-hour sodium (mg/day)

The excel macro is available to the interested readers upon request.

y=

1046673123400668608/(350239064189505\*(exp((3531436254348629333\*(x4))/278871333176082432 - (1029428416636463\*(x2))/11821949021847552 - (6046936049028651976227155329587\*(x3))/5192296858534827628530496329220096 - (7174116613898773\*(x1))/4503599627370496 + (5265280440701435\*(x5))/82225877571600384 - (4238812859056395\*(x6))/2563392612903944192 - (59359790278899894464583965820771\*(x7))/10384593717069655257060992658440192 - (892169922301093\*(x8))/562949953421312 - 80248351911675839565363283994357801436209977336819791029383321/5136250373222173315847622871286467214446840803510932471808000) + 1)) - 12996092384955034816/(3152151577705545\*(exp((184735206199699\*(x2))/9007199254740992 - (3577474057724871\*(x1))/9007199254740992 - (14523915171478658530948154954855\*(x3))/81129638414606681695789005144064 - (12812001752340026809\*(x4))/8923882661634637824 - (9297223828493865\*(x5))/14033216438886465536 + (4102187403909915\*(x6))/1464795778802253824 - (49662645891189670973235440579763\*(x7))/10384593717069655257060992658440192 - (6748177058736025\*(x8))/4503599627370496 + 110338835914423464760086933959186136414368786262019009904669/11464844583085208294302729623407292889390269650694045696000) + 1)) - 51354327159182934272/(3152151577705545\*(exp((5701375093269837491\*(x4))/557742666352164864 - (2338835675874231\*(x2))/15762598695796736 - (10799145421662625436185281953503\*(x3))/162259276829213363391578010288128 - (1717360167201859\*(x1))/1125899906842624 - (26506267993064315\*(x5))/1315614041145606144 + (26071822122652225\*(x6))/20507140903231553536 - (38137288497214277857630046760639\*(x7))/5192296858534827628530496329220096 + (2033628908715761\*(x8))/2251799813685248 + 47124205284197659436182735727018602275433558034229105146657/53502608054397638706746071575900700150487925036572213248000) + 1)) - 1516138472713251712/(3152151577705545\*(exp((94087258423139\*(x1))/17592186044416 - (2612189564270067\*(x2))/15762598695796736 + (6521155366694391064194353732063\*(x3))/20282409603651670423947251286016 + (6637958767200021035\*(x4))/17847765323269275648 + (29749131590949715\*(x5))/1315614041145606144 + (928693819678245\*(x6))/320424076612993024 + (7577354356110611254372446658485\*(x7))/5192296858534827628530496329220096 + (5540061784384827\*(x8))/4503599627370496 - 82495740939127387947919726242687807024511340842440507790151/4012695604079822903005955368192552511286594377742915993600) + 1)) + 17282544417722437888/(3152151577705545\*(exp((8333030929971173\*(x1))/9007199254740992 - (1094305067130479\*(x2))/13510798882111488 - (5854548123044747344362973105827\*(x3))/20282409603651670423947251286016 - (6694315858262698655\*(x4))/557742666352164864 - (27073275627705115\*(x5))/1315614041145606144 - (19019432833066655\*(x6))/5126785225807888384 + (64368578103533476111521647363643\*(x7))/20769187434139310514121985316880384 + (6053096490678353\*(x8))/72057594037927936 + 534783444429918740605548123629391602753340762889527786031639/20063478020399114515029776840962762556432971888714579968000) + 1)) - 36123337402578549248/(3152151577705545\*(exp((856738867360499\*(x1))/281474976710656 + (1266537037137089\*(x2))/7881299347898368 + (13558566016128026206390462398563\*(x3))/81129638414606681695789005144064 - (10262380320779629783\*(x4))/2230970665408659456 + (3092277695552095\*(x5))/82225877571600384 - (35228428754861835\*(x6))/2563392612903944192 + (1047806554346635537968522913251\*(x7))/324518553658426726783156020576256 + (2042379199886603\*(x8))/36028797018963968 - 375991443020447045986725830204917770865383102887158921302429/26751304027198819353373035787950350075243962518286106624000) + 1)) - 1774401998101663424/(630430315541109\*(exp((5268374233044811056077431304497\*(x3))/40564819207303340847894502572032 - (227389802657401\*(x2))/13510798882111488 - (1244668327628313\*(x1))/18014398509481984 + (1494384204315365323\*(x4))/278871333176082432 - (683425455633925\*(x5))/27408625857200128 + (1125196683119575\*(x6))/2929591557604507648 + (5398922008957840170952984880373\*(x7))/2596148429267413814265248164610048 - (3366163622523741\*(x8))/562949953421312 + 44878539917178891929665888146209075816597768215453161510677/5732422291542604147151364811703646444695134825347022848000) + 1)) + 28023148392069273344/(3152151577705545\*(exp((1459071213517393\*(x1))/1125899906842624 - (5858849029180003\*(x2))/47287796087390208 + (5329019278517045038003527350559\*(x3))/81129638414606681695789005144064 + (923376887567969901\*(x4))/92957111058694144 - (4617965927845125\*(x5))/109634503428800512 - (18134725513214475\*(x6))/10253570451615776768 + (12593147617977411290364810057105\*(x7))/5192296858534827628530496329220096 - (3305891451877167\*(x8))/4503599627370496 + 4101719286571350100472096540174812999962997447945388146553/16050782416319291612023821472770210045146377510971663974400) + 1)) - 2693250133097062912/(210143438513703\*(exp((16802202673065895483\*(x4))/8923882661634637824 - (2971762934743083\*(x2))/31525197391593472 - (14490759960927124911242114720999\*(x3))/324518553658426726783156020576256 - (2228029129243211\*(x1))/562949953421312 - (12883948801168555\*(x5))/438538013715202048 - (15728980977735905\*(x6))/10253570451615776768 + (41057974491410491637334104591307\*(x7))/5192296858534827628530496329220096 - (4478617714321033\*(x8))/4503599627370496 + 3536173182676223684236335335261547550901460801647710453698379/321015648326385832240476429455404200902927550219433279488000) + 1)) - 3998432671772083072/(1050717192568515\*(exp((8897287955461767914245938530137\*(x3))/162259276829213363391578010288128 - (3718691400415181\*(x2))/378302368699121664 - (693126456244659\*(x1))/562949953421312 - (3744844551474327595\*(x4))/185914222117388288 - (10174458704426275\*(x5))/657807020572803072 - (31696995230678755\*(x6))/10253570451615776768 + (10212752084007872086445606197173\*(x7))/2596148429267413814265248164610048 + (2425682538745395\*(x8))/2251799813685248 + 3239311798166316147817941538810581362904867913415642475729931/160507824163192916120238214727702100451463775109716639744000) + 1)) + 30386160635730235136/(3152151577705545\*(exp((4405003079989178491084134087037\*(x3))/10141204801825835211973625643008 - (8302344059893187\*(x2))/189151184349560832 - (6085141778806553\*(x1))/1125899906842624 - (7304202241353924677\*(x4))/1115485332704329728 - (3341434841035495\*(x5))/109634503428800512 + (39526015808475045\*(x6))/5126785225807888384 - (59895484568830351069233545397177\*(x7))/10384593717069655257060992658440192 + (1904550964040717\*(x8))/4503599627370496 + 91099552211149594959877672251139617333080189013119154332279/10031739010199557257514888420481381278216485944357289984000) + 1)) - 19055217637626267392/(3152151577705545\*(exp((1017973660282916740583322246467\*(x3))/2535301200456458802993406410752 - (3943095949075\*(x2))/23089744183296 - (1174233748117761\*(x1))/281474976710656 + (2494893906032016535\*(x4))/743656888469553152 - (24267428063311825\*(x5))/10524912329164849152 - (2165297635519635\*(x6))/5126785225807888384 + (37882830268987296708104256383085\*(x7))/20769187434139310514121985316880384 + (8282193778261125\*(x8))/18014398509481984 + 216102716913593260086915631500240344229739752480340846759/167195650169992620958581473674689687970274765739288166400) + 1)) - 44297763166565965568/(3152151577705545\*(exp((2321889174673331\*(x1))/1125899906842624 - (1062691726150163\*(x2))/54043195528445952 - (13174121022737543210029692300571\*(x3))/162259276829213363391578010288128 + (13067814013773745805\*(x4))/1115485332704329728 - (6382749422762035\*(x5))/219269006857601024 + (27395697401680215\*(x6))/2563392612903944192 + (40288430844717910180449211891569\*(x7))/10384593717069655257060992658440192 - (7797596259274295\*(x8))/9007199254740992 - 1686789092805321422709661662759579843107912652110397012484433/160507824163192916120238214727702100451463775109716639744000) + 1)) + 6717251572794280448/(630430315541109\*(exp((4508179797988975\*(x2))/47287796087390208 - (5403863674982669\*(x1))/4503599627370496 - (599499054373716677579293453119\*(x3))/10141204801825835211973625643008 - (2099935590266372641\*(x4))/743656888469553152 + (695078018281865\*(x5))/34621422135410688 + (12150140052433095\*(x6))/2563392612903944192 + (58496103072409514004023777676585\*(x7))/10384593717069655257060992658440192 - (2647059298553695\*(x8))/1125899906842624 - 100961871633466182957366161116159000642778813050179599137/35199084246314235991280310247303092204268371734586982400) + 1)) - 15447822464858788096/(3152151577705545\*(exp((4642433793787709\*(x2))/23643898043695104 - (7191934009272571\*(x1))/18014398509481984 + (11325456182186136773770834549769\*(x3))/40564819207303340847894502572032 + (4795473635435990279\*(x4))/371828444234776576 - (6772446197910715\*(x5))/219269006857601024 + (21452433356811895\*(x6))/41014281806463107072 - (6939663644733047866625002158519\*(x7))/1298074214633706907132624082305024 - (1004453225819855\*(x8))/562949953421312 - 461709974220746729252205496904944950637174089030329511988709/40126956040798229030059553681925525112865943777429159936000) + 1)) + 17966149462644323377201/630430315541109000

Note, exp(x)= (2.718281828)x

**Supplemnatray A.3: Selected FFQ Low Formula (Iran 2.a)**

x1=sex (1: female, 2: male); x2=age (year); x3=body mass index (Kg/m2); x4=waist to hip ratio; x5= sodium spot (mmol/Lit); x6= potassium spot (mmol/Lit); x7=creatinine spot (mg/dL); x8=spot acquisition time (1: morning, 2: afternoon, 3: evening); x9: physical activity (Mets); x10: discretionary salt (mg/day); y=predicted 24-hour sodium (mg/day)

The excel macro is available to the interested readers upon request.

y =

10071519002874282752/(3213655774261819\*(exp((6408528209685107\*(x1))/1125899906842624 - (4264576622476429\*(x2))/166633186212708352 + (7533402901784602008363023195187\*(x3))/324518553658426726783156020576256 - (64477800064905885019\*(x4))/4767060205571670016 - (24937843283012795\*(x5))/314689023962513408 + (121530337163568075\*(x6))/5800073370099777536 + (31176090078959525\*(x7))/7723110410986979328 + (6792647004326291\*(x8))/4503599627370496 + (5902746669128431\*(x9))/779122735535095808 + (8416150346146071\*(x10))/17592186044416000000 + 3796314494287533141668665635623861755599785612571631/1430722145238382420026663344271484322416121830440960) + 1)) - 1185286122920544816/(3213655774261819\*(exp((5904357880981825\*(x1))/4503599627370496 + (4910645727155513\*(x2))/166633186212708352 + (13591246634980905972690887910723\*(x3))/40564819207303340847894502572032 + (972173659090489463\*(x4))/74485315712057344 - (1503820016070465\*(x5))/48413695994232832 - (147659573697744325\*(x6))/5800073370099777536 + (27079006450325675\*(x7))/3861555205493489664 + (7254548509950867\*(x8))/2251799813685248 + (4182702824182061\*(x9))/1558245471070191616 + (2298873749036931\*(x10))/3518437208883200000 - 34287896731232024186012839922300595982540134396715/917129580281014371811963682225310463087257583616) + 1)) - 3481167098360864288/(3213655774261819\*(exp((3513153595967037\*(x1))/562949953421312 + (2752224023381943\*(x2))/20829148276588544 + (11161323173643529109464163375817\*(x3))/81129638414606681695789005144064 + (6909823732754480043\*(x4))/297941262848229376 - (15363139748054635\*(x5))/157344511981256704 + (12957570833128725\*(x6))/725009171262472192 + (21958282088884925\*(x7))/11584665616480468992 + (6654562499472049\*(x8))/18014398509481984 - (837186778971075\*(x9))/97390341941886976 - (15241478123208021\*(x10))/17592186044416000000 - 10039929912521946804764195958419030555800975767987779/357680536309595605006665836067871080604030457610240) + 1)) - 3586598354084743008/(3213655774261819\*(exp((2623156053554071\*(x1))/1125899906842624 + (1206093669793549\*(x2))/83316593106354176 - (6576200565981325975631788421751\*(x3))/10141204801825835211973625643008 - (84080882743329491235\*(x4))/38136481644573360128 + (9059703724470705\*(x5))/314689023962513408 - (30340474089103575\*(x6))/2900036685049888768 + (22082099167559425\*(x7))/123569766575791669248 + (6248710886063849\*(x8))/4503599627370496 + (6766353841231417\*(x9))/6232981884280766464 - (803405735650071\*(x10))/1099511627776000000 + 300714290518896464492557000901851612141605687567999/14903355679566483541944409836161295025167935733760) + 1)) + 6655549828301872768/(3213655774261819\*(exp((7876733296419733\*(x2))/83316593106354176 - (1600884444565099\*(x1))/562949953421312 - (1107510785043959224573404432309\*(x3))/2535301200456458802993406410752 + (59713847779901901989\*(x4))/4767060205571670016 - (20326928958052235\*(x5))/157344511981256704 + (17587562728500475\*(x6))/725009171262472192 + (44642837443577525\*(x7))/11584665616480468992 - (481580735070425\*(x8))/1125899906842624 - (1640652243764913\*(x9))/389561367767547904 - (8293719716397909\*(x10))/17592186044416000000 + 7883029572138980035860311057345798905287961019147/532262702841660126498014637005760536613140561920) + 1)) - 8882809451677392704/(3213655774261819\*(exp((757215834664940528833624208631\*(x3))/5070602400912917605986812821504 - (127103040476745\*(x2))/562949953421312 - (153831085780591\*(x1))/140737488355328 - (66433681936282389345\*(x4))/4767060205571670016 + (15998461786757915\*(x5))/314689023962513408 - (219536759403816425\*(x6))/11600146740199555072 - (150774627953247425\*(x7))/5792332808240234496 - (7422496450879989\*(x8))/2251799813685248 + (5838592253968835\*(x9))/1558245471070191616 + (126000271914513\*(x10))/549755813888000000 + 13054578313096765087559448575244668419023010406407/604190095117560143592340939303836284804105502720) + 1)) + 2110585928442310624/(3213655774261819\*(exp((719646550370573\*(x2))/166633186212708352 - (989966160223557\*(x1))/281474976710656 + (8378762446145319632377792831467\*(x3))/81129638414606681695789005144064 - (45142863315803255805\*(x4))/4767060205571670016 - (624072721084975\*(x5))/9834031998828544 + (52021011689809275\*(x6))/5800073370099777536 - (67547305639872125\*(x7))/15446220821973958656 - (4601857120652503\*(x8))/2251799813685248 - (6934435824885803\*(x9))/199455420296984526848 + (2723233852322097\*(x10))/17592186044416000000 + 8174680478661069353232969427827199888283672072636423/357680536309595605006665836067871080604030457610240) + 1)) + 3039937589984851296/(3213655774261819\*(exp((13489360423994155\*(x5))/2517512191700107264 - (3009563237725823\*(x2))/20829148276588544 - (15153657110419533889984699387671\*(x3))/40564819207303340847894502572032 - (489509720219304743\*(x4))/32651097298436096 - (1379525738853025\*(x1))/281474976710656 + (213764422851584125\*(x6))/23200293480399110144 - (30915667323212375\*(x7))/1930777602746744832 + (8824133425946513\*(x8))/2251799813685248 - (1693296460002207\*(x9))/12465963768561532928 + (9042282720372201\*(x10))/70368744177664000000 + 12123623026477011290198739318034319645986267165603/349980955293146384546639761318856243252475985920) + 1)) + 15387592602440365312/(3213655774261819\*(exp((65258936689465\*(x2))/562949953421312 - (3352202020737837\*(x1))/2251799813685248 - (13809198603207690331602978770109\*(x3))/81129638414606681695789005144064 + (60503283410400132205\*(x4))/4767060205571670016 + (2820756348695215\*(x5))/157344511981256704 - (51607314983671275\*(x6))/2900036685049888768 - (81067253620829425\*(x7))/11584665616480468992 + (3528100065055541\*(x8))/9007199254740992 - (931329461679425\*(x9))/1558245471070191616 - (22330662721219617\*(x10))/140737488355328000000 - 18023933136093868855405808086411855599881437438699/1381005931697280328211065004123054365266526863360) + 1)) - 3053695087059217728/(3213655774261819\*(exp((1128828938432071\*(x1))/562949953421312 + (2921805717381483\*(x2))/10414574138294272 - (1757667556053064597782498843003\*(x3))/20282409603651670423947251286016 + (64681121023358540161\*(x4))/76272963289146720256 - (45007664773047525\*(x5))/314689023962513408 + (1282121334902725\*(x6))/90626146407809024 + (120457598465422325\*(x7))/11584665616480468992 + (1270089356736769\*(x8))/2251799813685248 - (1481771495829985\*(x9))/1558245471070191616 + (10669885398273837\*(x10))/35184372088832000000 - 912348466243326378541498230443005988174103098062039/89420134077398901251666459016967770151007614402560) + 1)) + 53834746795608971391/3213655774261819000

Note, exp(x)= (2.718281828)x

**Supplemnatray A.4: Selected FFQ High Formula (Iran 2.b)**

x1=sex (1: female, 2: male); x2=age (year); x3=body mass index (Kg/m2); x4=waist to hip ratio; x5= sodium spot (mmol/Lit); x6= potassium spot (mmol/Lit); x7=creatinine spot (mg/dL); x8=spot acquisition time (1: morning, 2: afternoon, 3: evening); x9: physical activity (Mets); x10: discretionary salt (mg/day); y=predicted 24-hour sodium (mg/day)

The excel macro is available to the interested readers upon request.

y=

932936277051348224/(630430315541109\*(exp((2532786825013535682947981086527\*(x3))/40564819207303340847894502572032 - (3058483739202499\*(x2))/94575592174780416 - (3925086946542321\*(x1))/18014398509481984 + (15755179408203959677\*(x4))/4461941330817318912 + (29365154423604235\*(x5))/2631228082291212288 + (3551980008601965\*(x6))/1464795778802253824 + (13944112216106424735449344848357\*(x7))/5192296858534827628530496329220096 + (6015509926595307\*(x8))/4503599627370496 - (8668038768635577\*(x9))/1670835461754454016 + (1952764550277113\*(x10))/17592186044416000000 - 13172378591114880884821565981465470724812695653583756224351711/2126728670162306138593156345142052830981895020203745476608000) + 1)) + 27108364598058678272/(3152151577705545\*(exp((5817396801921095\*(x1))/1125899906842624 - (6986742060261853\*(x2))/94575592174780416 + (776124926912839706833680909453\*(x3))/2535301200456458802993406410752 + (19163044962092475841\*(x4))/17847765323269275648 + (3371026140959045\*(x5))/219269006857601024 + (1577331382743995\*(x6))/1281696306451972096 - (20581444469293111805546770583817\*(x7))/5192296858534827628530496329220096 - (1480371526050503\*(x8))/9007199254740992 + (73929403803835\*(x9))/26106804089913344 - (1743140800565877\*(x10))/4398046511104000000 - 2102131918336095238767028666051066743759096091886982438346349/132920541885144133662072271571378301936368438762734092288000) + 1)) - 4733993960787254144/(630430315541109\*(exp((28073926186263675\*(x6))/656228508903409713152 - (2956633364576791\*(x2))/63050394783186944 - (8386464108951594484167134219093\*(x3))/81129638414606681695789005144064 - (765515936778409509\*(x4))/92957111058694144 - (25189070545483955\*(x5))/2631228082291212288 - (7336748497116157\*(x1))/18014398509481984 - (66179631030966742180811421444381\*(x7))/10384593717069655257060992658440192 - (2040766752426731\*(x8))/1125899906842624 - (7928698873856405\*(x9))/13366683694035632128 + (2214569160035653\*(x10))/17592186044416000000 + 83620895507782592514822012107632455141812049097705858473769013/4253457340324612277186312690284105661963790040407490953216000) + 1)) - 25399124188786509056/(3152151577705545\*(exp((7846720621030327\*(x1))/2251799813685248 + (206761128244939\*(x2))/1970324836974592 - (991969719582822867545145566167\*(x3))/5070602400912917605986812821504 + (3873232507966936009\*(x4))/2974627553878212608 - (12799996858806205\*(x5))/328903510286401536 + (3536869946513935\*(x6))/2563392612903944192 + (34006741516731640543583974308693\*(x7))/83076749736557242056487941267521536 + (3947418769811643\*(x8))/4503599627370496 + (199641080485257\*(x9))/104427216359653376 + (1292206636501909\*(x10))/140737488355328000000 + 72759128628701775716214064182321604698460862870780036540029/88613694590096089108048181047585534624245625841822728192000) + 1)) - 12088846209863169536/(1050717192568515\*(exp((5934832701593583\*(x1))/2251799813685248 - (8091127272324491\*(x2))/94575592174780416 + (2936415336408211538381054382301\*(x3))/40564819207303340847894502572032 + (229605729749221949\*(x4))/278871333176082432 + (22873639487835235\*(x5))/1315614041145606144 - (23688106247745395\*(x6))/5126785225807888384 + (34833997722349316281181986982187\*(x7))/10384593717069655257060992658440192 + (8206293493945885\*(x8))/18014398509481984 + (643491243870553\*(x9))/835417730877227008 - (636732042906681\*(x10))/8796093022208000000 - 2664744337819568908150147977354547343095008584524879303313471/708909556720768712864385448380684276993965006734581825536000) + 1)) - 165257112583399680/(23349270945967\*(exp((3190387666544483\*(x2))/94575592174780416 - (5781530386444175\*(x1))/1125899906842624 - (3618748789541810849215485760775\*(x3))/20282409603651670423947251286016 - (5665806649009514699\*(x4))/557742666352164864 + (17651595965438335\*(x5))/2631228082291212288 + (10126882904045\*(x6))/1464795778802253824 - (31936371529255317719854548582381\*(x7))/20769187434139310514121985316880384 + (2977405820178611\*(x8))/4503599627370496 - (2257252868703249\*(x9))/1670835461754454016 + (4513158652588753\*(x10))/17592186044416000000 + 2239795719680177002343686542477012679965018112215688991743073/151909190725879009899511167510146630784421072871696105472000) + 1)) + 7800573902722022144/(630430315541109\*(exp((3780598553418821\*(x1))/1125899906842624 + (3546491000629133\*(x2))/47287796087390208 - (7314757060087538210762353769435\*(x3))/20282409603651670423947251286016 + (3589406179350639155\*(x4))/278871333176082432 + (9733695582293715\*(x5))/438538013715202048 + (21613199375452075\*(x6))/41014281806463107072 + (32341960073007201705075221050467\*(x7))/20769187434139310514121985316880384 + (2904752594602985\*(x8))/9007199254740992 - (4606215580026673\*(x9))/1670835461754454016 - (2681288800042831\*(x10))/140737488355328000000 - 19964740329464233255544091500900502735877737326469403749961477/1063364335081153069296578172571026415490947510101872738304000) + 1)) + 29754474798578456576/(3152151577705545\*(exp((7410811580344451\*(x2))/189151184349560832 - (2091275772921153\*(x1))/562949953421312 - (3967762992030772907895376390233\*(x3))/10141204801825835211973625643008 - (8917054802202016259\*(x4))/4461941330817318912 - (751800217246925\*(x5))/92323792361095168 + (40091727800646995\*(x6))/20507140903231553536 + (45724725814696699703576134976997\*(x7))/83076749736557242056487941267521536 + (1759017406796345\*(x8))/18014398509481984 + (1697913174074671\*(x9))/835417730877227008 - (3864781540307799\*(x10))/281474976710656000000 + 157174282954048976818748128176581428321686845562553422605953/9327757325273272537689282215535319434131118509665550336000) + 1)) + 9848892763838903552/(1050717192568515\*(exp((11128477666754558380864085914873\*(x3))/162259276829213363391578010288128 - (4485624216571993\*(x2))/378302368699121664 - (4454876147179989\*(x1))/562949953421312 + (23333110729286698807\*(x4))/8923882661634637824 - (1822363946261825\*(x5))/69242844270821376 + (10057803783285485\*(x6))/5126785225807888384 - (18107403163138270461847737666699\*(x7))/5192296858534827628530496329220096 - (2345878894848351\*(x8))/2251799813685248 - (691223055816809\*(x9))/104427216359653376 + (3430590951069069\*(x10))/35184372088832000000 + 9082397290824686268560830478056456691328955190182729035590557/447732351613117081809085546345695332838293688463946416128000) + 1)) + 2974621481950122944/(1050717192568515\*(exp((3343083200266191\*(x1))/4503599627370496 + (573626113539809\*(x2))/5910974510923776 + (3917068615891245355151425318097\*(x3))/40564819207303340847894502572032 + (4462340167008211543\*(x4))/2974627553878212608 + (20016654025206425\*(x5))/5262456164582424576 - (18230506003922865\*(x6))/82028563612926214144 - (7212661987413398201166224614227\*(x7))/2596148429267413814265248164610048 + (6086873655701959\*(x8))/9007199254740992 - (1142274353509909\*(x9))/238690780250636288 + (7479499969570619\*(x10))/70368744177664000000 - 11211268536485919132414557433559027713297295792247637879850033/2126728670162306138593156345142052830981895020203745476608000) + 1)) + 18848355241400543744/(3152151577705545\*(exp((6324338159903167\*(x1))/2251799813685248 + (381628440783895\*(x2))/9007199254740992 - (978356131540775139657830520393\*(x3))/5070602400912917605986812821504 + (3387810589132236193\*(x4))/1487313776939106304 - (5147251756535695\*(x5))/877076027430404096 - (22641784255792335\*(x6))/10253570451615776768 - (58773396549726683751100298939961\*(x7))/20769187434139310514121985316880384 - (427688350833109\*(x8))/281474976710656 - (7178317406254367\*(x9))/3341670923508908032 - (1448568187642427\*(x10))/8796093022208000000 + 2506256652709422730568873939416400615632484710783633879298729/265841083770288267324144543142756603872736877525468184576000) + 1)) - 14513088870652934528/(3152151577705545\*(exp((7936190053081308177617659575649\*(x3))/81129638414606681695789005144064 - (3667415926047925\*(x2))/23643898043695104 - (2564978794978827\*(x1))/562949953421312 - (13740374625770568521\*(x4))/8923882661634637824 - (13075171376781215\*(x5))/2631228082291212288 + (16142226718323255\*(x6))/20507140903231553536 - (57016444873217609093968003905933\*(x7))/20769187434139310514121985316880384 - (7311699848201231\*(x8))/9007199254740992 - (4666919930259543\*(x9))/1670835461754454016 + (5038324588952491\*(x10))/70368744177664000000 + 9931750016487004277339344989102251976056916824557721631126281/607636762903516039598044670040586523137684291486784421888000) + 1)) - 8993644683586601984/(1050717192568515\*(exp((24864593736685\*(x2))/9007199254740992 - (3790211367206629\*(x1))/1125899906842624 + (704786639446695340756103468707\*(x3))/10141204801825835211973625643008 + (12511377746413201381\*(x4))/1115485332704329728 + (1066982479760665\*(x5))/54817251714400256 + (8262672256513385\*(x6))/2563392612903944192 - (12343255166919059364367817834847\*(x7))/10384593717069655257060992658440192 - (7935136716694651\*(x8))/9007199254740992 - (4876814904740503\*(x9))/835417730877227008 + (47849820481737\*(x10))/4503599627370496000 - 564538181278535050156236659153770971271025580017212301493349/75954595362939504949755583755073315392210536435848052736000) + 1)) - 32957979398915531008/(3152151577705545\*(exp((3618249523904161\*(x1))/2251799813685248 + (1999502689782317\*(x2))/47287796087390208 - (14268072900970358349748705623677\*(x3))/162259276829213363391578010288128 + (3496602549378901433\*(x4))/371828444234776576 + (8973789941233465\*(x5))/1754152054860808192 - (4636335686689185\*(x6))/1464795778802253824 - (296363125224762361762125691845\*(x7))/41538374868278621028243970633760768 + (3179549718873597\*(x8))/2251799813685248 + (3739385149641507\*(x9))/3341670923508908032 - (1931710238164089\*(x10))/8796093022208000000 - 25709402022823683901819880076784921884662714034568304320593799/1701382936129844910874525076113642264785516016162996381286400) + 1)) + 20467300847455222016/(3152151577705545\*(exp((2165772615111434822672976294729\*(x3))/20282409603651670423947251286016 - (7795859728900711\*(x2))/189151184349560832 - (5253876979065413\*(x1))/2251799813685248 - (137471653633848103\*(x4))/69717833294020608 - (26547224423845\*(x5))/3377699720527872 - (12318999512088075\*(x6))/2563392612903944192 - (20254293539795465091390959835957\*(x7))/83076749736557242056487941267521536 + (3235974038188067\*(x8))/144115188075855872 + (2529518495323919\*(x9))/1670835461754454016 + (7935044495072311\*(x10))/35184372088832000000 + 7689703902811596235208230814513368605007719176709973768037/1365037657357064273808187641297851624506992952633982976000) + 1)) + 1596062269979801098801/630430315541109000

Note, exp(x)= (2.718281828)x