

I aŋh i jh{k. kæəi jh{k. k mRi knkdh nksfu; a.k mi pkj I srqyuk gsrq
I r̥fyr vſlkdYi uk, a

Iehr I^gjo] fl uh oxh] e® gk: u*] I hek tXxh ,oa no^{sh}z dekj

Hkk—vuqj - & Hkkj rh; —f'k l ksf'; dh vuq zkku l tFkku]

i w k] ubZfnYy&110012] Hkkjr

i klr% t ykbz 2018

Lohdr%vxLr 2018

I kjkák

I ðsth i jhk.k.kaclks [kk| , oai ksk.k i jhk.k.kaclks vfhklu vx dcf#lk eafy; k tkrk g§ ftI eadN I ðsth rF; kaclks n'kkusdcfy, -f"k@i kqmRi kn I fefy whole fu"dkludfy, egRoi wklzgSfd =fv dsI Hkh I kskadksU; ure djuk vFkok i wklr% l ekkr djuk, oamu I Hkh dkj dkclks i gpkuu o fu; f=r djuk tks i fj.kke clks i Hkhfor vFkok ml eagLr{ki djrsgA i jhk.k mRi knkadh r§ kjh l sI Ec) i Hkhoh I kskadcvfrfjDr eki us, oaeV; kdu i fØ; k] de i Hkko] i Hkkj i Hkko, oaeV; kdu drkldh FkdkoV dcfdkj.k Hkh fkhkUrk gksh g§ dHkh&dHkh, dh vfhkldYi ukvka dh vko'; drk gksh g§ tksvfr egRoi wklz mRi knkadh ryuk grqmpPp i fj'k] vkhdyu] de #fp okyh ryuk (ftudk vkhdyu de ifj'k] rk l sfid; k tk, xk) dcfLFku ij dj na, d, dh fLFkfr eatcfid mRi kn dIVRLVT dcfid dh mi l efp; eafoksk #fp gksrc i jhk.k eafu; a.k mRi knkadh fefy whole dj fy; k tk, A dkbzfu; a.k mRi kn fu. kkh d e. My dcfy, Hkh I gk; d gksl drk g§; fn ; g vkhdu ekud mi yck djokrk gftI l sv/; ; u dsI fj.kke kadh ryuk grqvk/kj feyrk g§; gkaj bu ifjfLFkfr; kaj ppkldcfy, cg&I =h; i jhk.k.kaclks qmi pkj cuke fu; a.k dh , d Jekyk i klr dh xbzqSA

'kCn dCh & l osh i j h{k.k] i ksk.k i j h{k.k] vfHkdYi ukA

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Balanced designs for comparing test products with two controls in sensory trials

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ABSTRACT

Sensory trials are an integral part of food and nutrition experiments involving agricultural/animal produce to demonstrate some sensory fact. To draw definite conclusion from the study, it is important to eliminate or minimize all sources of error, and recognize and control all factors that may influence or interfere with the result. In addition to various potential sources associated with the preparation of the test products, there may be variability due to measurement or assessment process, order effects, carryover effects, assessor fatigue etc. Sometimes, designs are required which can provide higher precision estimates for the crucial product comparisons, at the cost of the comparisons which are of lesser interest, and will be estimated with lower precision. One situation where there is special interest in a subset of product contrasts arises when control products are included in the trial. A control product provides a calibration standard, which can serve as a basis for comparison of results across studies may be helpful to the panel. Here, a series of treatment vs. control designs for multi-session trials are obtained to deal with such situations.

Keywords- Sensory trails, Nutrition, Product contrast

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I oñh elY; kdu , d , s h oñkfud 0; oLFkk gS ft l ds }jkj [kk | i nkFkk , oa lk s ka dcl l a kst u] tS s fd #i & jæ] Li 'k] xdk] jpu] rki eku , oa Lkn dcfy , ekuo vufo; kvka dks eki k vlg fo' ysk. k fd; k tkrk gA I oñh i jh{k. k [kk | ka , oa i ksk. k i jh{k. k] ftues -f'k , oa lk' kq mRi kn I fefyr g] dcfy vflkdYi ukj vkoj gA I oñh i jh{k. k I keku; r%o; atuk@mRi knkadh jat eal ekurk@vI ekurk dh ryuk] 0; atuk@mRi knkadh oréku jat dk fu/kkj .k] fd l h vo; o vFkok [kk | mRi kn dcfot'k"V xqk dk i rk yxku\$ vflre [kk | mRi kn eamI dsew xqkks dls eko sk dk i rk yxku\$ mRi kn dls i wli hhdj. k] mRi kn feyu] mRi kn fu#i .k bR; kfn dcfy , fd; k tkrk gA dHkh&dHkh , s h vflkdYi ukvka dh vko'; drk gkrh gS tks mRi kn ryukvka dls elpp; kgryqvfk d i fj'k] nA foftkdu ryukvka 1/4 keku; r%ftl gci jh{k. k cuke fu; a. k mi pkj ryukvka gryq vflkdYi uk , adgk tkrk g] gryq vrlj & l ddkh i fj'k] ; ka nsus okyh vflkdYi uk , abu i fjfLfkfr; ka ea l gk; d gA foftkdu i jh{k. k fol; kl tS s fd [k. M vflkdYi uk ,] drkj&LrEhk vflkdYi uk , a , ouuhM+vflkdYi ukvka dcrxk i jh{k. k cuke fu; a. k ryukvka dls {k= eacgr i svu] dku fd; s x , gA bl fo"k; i j foopukRed , oa mR-V i qjkoykdu dcfy , gnk; r vlfn 1/1988%dk mRy{k fd; k x; k gA

ØKW vkoj vflkdYi ukvka dks l dks/kf fd; k tk l drk gsvkj blgal oñh i jh{k. kksdSY , mi ; kx fd; k tk l drk gA mi pkj cuke fu; a. k ryukvka gryq ØKW vkoj vflkdYi uk , al kfgr; eamiyC/k gafftllgal elpr l dksku dcmijklr I oñh i jh{k. kksa i jh{k. k cuke fu; a. k ryukvka gryq mi ; kx fd; k tk l drk gA mi pkj cuke fu; a. k ryukvka gryq ØKW vkoj vflkdYi ukvka dk , d vPNk i qjkoykdu etenekj 1/1996%eanskk tk l drk gA vkoj 1/2002%us ØKW vkoj vflkdYi uk fol; kl eafu; a. k&i jh{k. k mi pkj dñMLVt dcvkyd yu gryqb"Vre vflkdYi ukvka dhs l jpu] dha vxoky bR; kfn 1/2004%usfofy; el 1/1949% yvlu oxz i jh{k. k cuke fu; a. k feyku }jkj ryuk gryq ØKW vkoj vflkdYi ukvka dh dN Jf.k; ka i klr dh tks fift; u , oajk?kojko 1/1987% }jkj nh xbZ fof/k dh , d fo'ksk fLFkfr gA vxoky bR; kfn 1/2004%us; g fl) dj fn; k gS fd ; s vflkdYi uk , a 'kj&b"Vre gA gnk; r , oa ; kx 1/2006% us mPp n{k fu; a. k LrFyf ØKW vkoj vflkdYi uk , al ftr dha

; kx , oa i kdZ 1/2007% us i jh{k. k cuke fu; a. k mi pkj ryuk djsdçfy , ØKW vkoj vflkdYi uk , al ftr dha l kuo kus 1/2007% }jkj tbrY; i jh{k. k gryq mi ; Ør vflkdYi ukvka dh dN Jf.k; kx , oa LVQdtu 1/2008% us i jh{k. k cuke fu; a. k ryuk gryq ØKW vkoj vflkdYi ukvka dh dN Jf.k; al ftr dha gnk; r , oa ; kx 1/2005% ; ku , oa yk 1/2010% vxoky , oa >k 1/2009% us i jh{k. k mi pkj dcl kfk fu; a. k mi pkj dh ryuk djsdçmnas ; dcfy , l tu vflkdYi ukvka dh dN i) fr; kanhA

bl yqk el] cg&l =h; i jh{k. k gryq mi pkj cuke fu; a. k vflkdYi ukvka dh , d Jqk dk l tu fd; k x; k gsf t l segRoi wZmRi kn ryukvka gryq mPp ifj'k] rk dcvkyd yu mi yC/k gkrsqA

vflkdYi uk dh l jpu]

eku ylift ,] i jh{k. k mRi kn a dh l {; k t , , d fo"ke vHkT; vFkok fo"ke ?kr gA eku ylift , nksfu; a. k mRi kn gft-1 i jLij vkoj ; rh; yvlu oxz(MOLS) dsi wZ l elpp; jpu] dft , A yvlu oxz dh vflre drkj dks gVk nhft , A 'kks l kjf.k; ka (t-1)xt vdkdj dh gA i Eke l kj. kh el] i Eke drkj dks i Eke fu; a. k rFkk vflre drkj dksf}rh; fu; a. k }jkj cny nhft , A bl h i ddkj f}rh; l kj. kh el] f}rh; drkj dks i Eke fu; a. k rFkk vflre l s , d igyh drkj dksf}rh; fu; a. k }jkj cny nhft , A bl i fO; k dksbl h i ddkj cuk , jf[k , A bl i ddkj t LrEhk dh i R; d l kj. kh el] t i jh{k. k mRi kn l h<huék ?Vrs Øe ea i Eke fu; a. k }jkj ifrLFkkfir gksx , gsvkj t i jh{k. k mRi kn l h<huék c<fs oYkh; Øe ea f}rh; fu; a. k }jkj ifrLFkkfir gksx , gsvkj tc rd fd i R; d drkj nksuka fu; a. k }jkj ifrLFkkfir gks tkrh gA vc nks1 kjf.k; kdkks {k=rth; bl i ddkj fudV jf[k , 1/4 d l e; ij nks1 kjf.k; kdkks fd nksfu; a. k mRi kn l a Ør l kj. kh eadHkh Hkh fd l h Hkh , d drkj eal kf&l kf k u fn [k] bl i ddkj dh (t-1)×2t vdkdj dh vyx&vyx (t-1)/2 l kjf.k; ka cuk ylift , A i R; d l a Ør l kj. kh dks m?okZkj , d dcfu ps vU; bl i ddkj j [krs jfg , fd i R; d l kj. kh dh i gpk u cuh jgA i R; d l a Ør l kj. kh dks , d l = dh rjgl , d l kj. kh dcfu vU; d drkj d®vof/k dh rjg vlg i R; d LrEhk dks , d fu. kks d dh rjg yus l svflre 0; oLFkk ifj. kke ea t+2 1/4 t i jh{k. k +2 fu; a. k mRi knkaes = (t-1)/2 l = p=(t-1) vof/k; kaifr l = , oa2t fu. kks dkgryqcg&l =h;

Hkjr; df'k vuq dku if=dk

I osh i jhk.k grq, d vflkdYi uk nrh gA ; svflkdYi uk, a i Hkkj i Hkkokagsqj rfyry gA

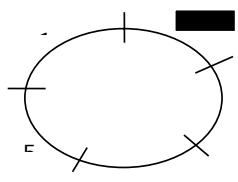
ifj.kk ,oaoopuk

eku yhft, t=5 vkg c=2 cg&l =h; I osh i jhk.k. kagsq ft l eas=2] p=4 vkg n=10 dsMOLS dk mi ; kx djrsgq ,d l ftr vflkdYi uk uhspsnh XkbZg%

fu. k d

vof/k	I	II	III	IV	V	VI	VII	VIII	IX	X
i	0 ₁	0 ₁	0 ₁	0 ₁	0 ₁	1	2	3	4	5
ii	2	3	4	5	1	0 ₁				
I	iii	3	4	5	1	2	0 ₂	0 ₂	0 ₂	0 ₂
=	iv	0 ₂	0 ₂	0 ₂	0 ₂	2	3	4	5	1
	v	1	2	3	4	5	0 ₂	0 ₂	0 ₂	0 ₂
	vi	0 ₂	0 ₂	0 ₂	0 ₂	5	1	2	3	4
II	vii	0 ₁	4	5	1	2				
	viii	5	1	2	3	4	0 ₁	0 ₁	0 ₁	0 ₁
	gk 1] 2] &5	ijhk.k	n'kkrs g	tcf	d	0 ₁	,oa	0 ₂	nks	fu; a.k inf'kr djrsgq
	mRi kn i Hkkokadcvklyu grqj puk vko; g (C) uhspsbl i dklj fn; k x; k g%									
	6.73	-0.66	-0.86	-0.86	-0.66	-1.83	-1.83			
	-0.66	6.73	-0.66	-0.86	-0.86	-1.83	-1.83			
	-0.86	-0.66	6.73	-0.66	-0.86	-1.83	-1.83			
	-0.86	-0.86	-0.66	6.73	-0.66	-1.83	-1.83			
	-0.66	-0.86	-0.86	-0.66	6.73	-1.83	-1.83			
	-1.83	-1.83	-1.83	-1.83	-1.83	5.49	3.67			
	-1.83	-1.83	-1.83	-1.83	-1.83	3.67	5.49			

bl vko; g l s; g n[kk tk l drk g\$fd ; g , d vkf'kd l rfyry vflkdYi uk gStgkaij i jhk.k mRi knkd d l hks i Hkk , d ifjorl'kh o'kh; l kgp; l ; kstuk dk i kyu dj jgs g l kgp; l ; kstuk ea mRi knkd dh , d l Hkkfor 0; oLFkk dksuhpsbl i dklj fn[kk; k tk l drk g%



fdl h pki eafn; sx; smRi kn dcfy, , dne ck; a vkg nk; a pki eafn[kk; h nsus okys i jhk.k mRi kn i fke l kgp; l g n[ss ck; a vkg nk; a f}rh; l kgp; l g vr%

fofllku i jhk.k mRi knkd s l cf/kr i fked dUVRVf dk vkydu rnkut l j nksfllku i dklj dsi l j. k sfod; k x; k g

I h/so i Hkkj i Hkkokagsqj jhk.k cuke i jhk.k V(τ_t - τ_r)σ⁻² , oa V(ρ_t - ρ_r), i jhk.k cuke fu; a.k V(τ_t - τ_r) , oa V(ρ_t - ρ_r) dcmRi knkd cf/kr dUVRVf dsvklyu dsvklyu r i l j.k dh x.kuk dcmnns; l sfodfl r fd; sx, , l , , l i kxe dk mi ; kx fd; k x; k g t=5 vkg c=2 cg&l =h; I osh i jhk.k gq ft l eas=2] p=4 vkg n=10 dsMOLS dk mi ; kx djrsgq ,d l ftr vflkdYi uk dk l af.kr vkg r i l j.k bl i dklj g

$$\bar{V}(\tau_t - \tau_r) \sigma^{-2} = 0.436, \bar{V}(\tau_t - \tau_c) \sigma^{-2} = 0.266,$$

$$\bar{V}(\rho_t - \rho_r) \sigma^{-2} = 0.619, \bar{V}(\rho_t - \rho_c) \sigma^{-2} = 0.367.$$

fu"df"l

; g i) fr nks fu; a.k okys i jhk.k mRi knkd d t fo"ke vHkkT; vFkok vHkkT; ?kr l q; k dh ryuk grq i Hkkj i Hkkokadcfy, l rfyry vflkdYi ukvkdah , d J[lyk l ftr djrh gA fu. k dka dh l q; k i jhk.k mRi knkd dh l q; k dh nksph pkfg, A ; svflkdYi uk, avk'kd i l j.k l rfyry gftueai jhk.k mRi kn i fgorl'kh o'kh; l kgp; l ; kstuk dk i kyu dj jgs g i jhk.k cuke fu; a.k dUVRVf dsfy, vuelfur i l j.k i jhk.k cuke i jhk.k dUVRVf dh ryuk eade ik; sx, vkg ; g l hksdcl kfk&l kfk i Hkkj i Hkkokadcfy, ik; sx, rFkk ; si l j.k i jhk.k mRi knkd dh l q; k c<usij de gksx, Fk

I mHkz

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