

SECTION 3 - TABLES

STUDY III

#210-76-0175

STUDY III

TABLE OF CONTENTS

	<u>TABLE NUMBER</u>
Distribution of Smoking Habits, Height and Weight by Age Group (Follow-up Study).	1
Symptoms Reported in 1977 by the 177 Grain Workers Followed since 1974.	2
Status of Symptoms since 1974.	3
Pulmonary Function - All Grain Workers (Follow-up Study).	4
Pulmonary Function - Grain Workers - Smokers 1974-1977 (Follow-up Study).	5
Pulmonary Function - Grain Workers - Smokers 1974-1977 (Follow-up Study).	6
Pulmonary Function - Grain Workers - Smokers 1974-1977 (Follow-up Study).	7
Pulmonary Function - Grain Workers - Smokers 1974, Ex-smoker-1977 (Follow-up Study)	8
Yearly Decrements in Lung Functions Tested in all Grain Workers and by Smoking Categories.	9
Prospective Study - Pulmonary Function Changes in Skin Reactors and Non-reactors and in Workers with or without Chronic Bronchitis or Occupational Asthma.	10

TABLE III - 1

DISTRIBUTION OF SMOKING HABITS, HEIGHT AND WEIGHT BY AGE GROUP (FOLLOW-UP STUDY)

Age (Years)	Smokers - 1974-1977				Ex-smokers - 1974-1977				Nonsmokers - 1974-1977			
	(no.)	(%)	(cm)	(kg)	(no.)	(%)	(cm)	(kg)	(no.)	(%)	(cm)	(kg)
20-29	19	56	177.4	80.6	5	15	182.0	81.4	2	6	175.3	74.9
30-39	23	68	180.2	85.8	2	6	181.9	90.7	3	6	177.0	81.6
40-49	25	48	176.3	82.8	10	19	178.0	89.6	9	17	176.1	92.1
50-64	19	37	172.7	76.0	14	27	176.9	95.7	10	19	173.0	81.5
20-64	86	50	176.8	81.6	31	18	178.4	91.1	24	14	174.8	84.9

Age (Years)	Smokers -1974 Ex-smokers -1977				Ex-smokers - 1974 Smokers - 1977				Nonsmokers - 1974 Ex-smokers - 1977				All Groups		
	(no.)	(%)	(cm)	(kg)	(no.)	(%)	(cm)	(kg)	(no.)	(%)	(cm)	(kg)	(no.)	(cm)	(kg)
20-29	7	21	176.4	81.6	0	0	0	0	1	3	172.7	81.0	34	177.6	80.6
30-39	5	15	175.3	77.3	1	3	178.4	86.0	0	0	0	0	34	179.2	84.4
40-49	6	12	175.9	78.6	1	2	177.8	73.4	1	2	172.7	83.3	52	176.4	85.1
50-64	6	12	170.4	76.1	1	2	175.3	75.6	2	4	185.1	95.9	52	174.1	83.1
20-64	24	14	174.4	78.6	3	2	177.1	78.3	4	2	178.9	89.0	172	177.0	83.0

TABLE III-2
SYMPTOMS REPORTED IN 1977
BY THE 177 GRAIN WORKERS FOLLOWED SINCE 1974

	<u>N</u>	<u>%</u>
Cough in a.m.	66	37
Chronic Bronchitis	82	46
Cough on Exposure	119	67
Wheezing on Exposure	113	64
Dyspnea on Exposure	98	55
Grain Fever	53	30
Eye symptom on exposure	139	79
Nasal symptom on exposure	140	79

TABLE III - 4

**PULMONARY FUNCTION
ALL GRAIN WORKERS (FOLLOW-UP STUDY)**

	N	1974 $\bar{x} \pm 1 \text{ SD}$	1977 $\bar{x} \pm 1 \text{ SD}$	1974-1977 Difference $\bar{x} \pm 1 \text{ SD}$	P
FEV ₁ ml	177	3829 ± 846	3801 ± 860	- 29 ± 323	NS
% Predicted		98 ± 18	99 ± 18	.1 ± 8.6	NS
FVC ml	177	4903 ± 914	4838 ± 913	- 64 ± 429	<.02
% Predicted		101 ± 15	101 ± 15	- .2 ± 9.8	NS
MMF L/min	165	252 ± 81	228 ± 74	- 24 ± 39	<.001
% Predicted		87 ± 27	78 ± 23	-9.4 ± 14.4	<.001
$\dot{V}_{\text{Max}} 50 \text{ L/sec}$	170	4.5 ± 1.6	4.0 ± 1.5	- .5 ± 1.0	<.001
% Predicted		73 ± 26	65 ± 24	-7.8 ± 16.6	<.001
$\dot{V}_{\text{Max}} 75 \text{ L/sec}$	122	1.8 ± .6	1.6 ± .5	- .2 ± .4	<.001
% Predicted		56 ± 18	49 ± 17	-6.8 ± 12.1	<.001
D _L ml/CO/min /mmHg	168	32.0 ± 6.1	33.3 ± 6.2	1.3 ± 4.2	<.001
% Predicted		104 ± 19	107 ± 19	2.9 ± 14.1	<.01

TABLE III - 5
PULMONARY FUNCTION
GRAIN WORKERS - SMOKERS 1974-1977 (FOLLOW-UP STUDY)

	N	1974 $\bar{x} \pm 1 \text{ SD}$	1977 $\bar{x} \pm 1 \text{ SD}$	1974-1977 Difference $\bar{x} \pm 1 \text{ SD}$	P
FEV ₁ ml	87	3905 ± 956	3808 ± 953	33 ± 305	NS
% Predicted		95 ± 19	96 ± 18	.8 ± 8.3	NS
FVC ml	87	4887 ± 1000	4870 ± 979	- 16 ± 429	NS
% Predicted		99 ± 16	100 ± 16	.6 ± 10.3	NS
MMF L/min	80	249 ± 83	227 ± 81	- 22 ± 38	<.001
% Predicted		84 ± 27	76 ± 23	-9.1 ± 14.3	<.001
$\dot{V}_{\text{Max 50}}$ L/sec	84	4.3 ± 1.6	3.9 ± 1.6	- .4 ± 1.0	<.01
% Predicted		69 ± 25	63 ± 24	-6.3 ± 16.9	<.01
$\dot{V}_{\text{Max 75}}$ L/sec	56	1.8 ± .6	1.6 ± .3	- .2 ± .4	<.001
% Predicted		55 ± 18	49 ± 18	-5.9 ± 12.9	<.001
D _L ml/CO/min /mmHg	83	30.8 ± 5.4	31.7 ± 6.0	.9 ± 3.4	<.02
% Predicted		102 ± 16	103 ± 17	1.4 ± 11.4	NS

TABLE III - 6
PULMONARY FUNCTION
GRAIN WORKERS - SMOKERS 1974-1977 (FOLLOW-UP STUDY)

	N	1974 $\bar{x} \pm 1 \text{ SD}$	1977 $\bar{x} \pm 1 \text{ SD}$	1974-1977 Difference $\bar{x} \pm 1 \text{ SD}$	P
FEV ₁ ml	32	3878 ± 791	3793 ± 815	85 ± 316	NS
% Predicted		99 ± 19	99 ± 19	- 1.8 ± 7.9	NS
FVC ml	32	5075 ± 862	4891 ± 886	- 184 ± 342	<.005
% Predicted		105 ± 15	102 ± 14	- 3.0 ± 7.1	<.01
MMF L/min	29	247 ± 68	224 ± 68	-22.7 ± 33.1	<.001
% Predicted		86 ± 25	78 ± 25	- 9.1 ± 11.7	<.010
$\dot{V}_{\text{Max 50}}$ L/sec	30	4.6 ± 1.6	3.9 ± 1.4	- .8 ± 1.1	<.01
% Predicted		75 ± 27	63 ± 24	-11.5 ± 17.0	<.001
$\dot{V}_{\text{Max 75}}$ L/sec	22	1.8 ± .7	1.4 ± .5	- .4 ± .5	<.001
% Predicted		57 ± 22	44 ± 17	-12.6 ± 15.6	<.01
D _L ml/CO/min /mmHg	31	35.7 ± 7.3	36 ± 6	+ .5 ± 5.9	NS
% Predicted		110 ± 24	110 ± 19	.1 ± 20.0	NS

TABLE III - 7
PULMONARY FUNCTION
GRAIN WORKERS - SMOKERS 1974-1977 (FOLLOW-UP STUDY)

	N	1974 $\bar{x} \pm 1 \text{ SD}$	1977 $\bar{x} \pm 1 \text{ SD}$	1974-1977 Difference $\bar{x} \pm 1 \text{ SD}$	P
FEV ₁ ml	26	3784 ± 702	3784 ± 650	+ .3 ± 399	NS
Z Predicted		102 ± 14	105 ± 15	1.5 ± 10.5	NS
FVC ml	26	4697 ± 883	4700 ± 805	3.6 ± 529.3	NS
Z Predicted		101 ± 16	104 ± 16	2.4 ± 11.7	NS
MMF L/min	26	261 ± 94	224 ± 68	- 37 ± 43	<.001
Z Predicted		94 ± 30.1	82 ± 22	-11.8 ± 14.9	<.001
$\dot{V}_{\text{Max 50}}$ L/sec	25	4.8 ± 1.5	4.1 ± 1.3	- .7 ± .9	<.01
Z Predicted		80 ± 26	69 ± 22	-11.3 ± 16.7	<.01
$\dot{V}_{\text{Max 75}}$ L/sec	21	1.7 ± .6	1.5 ± .6	- .1 ± .2	<.02
Z Predicted		55 ± 20	51 ± 19	- 3.9 ± 7.3	<.05
D _L ml/CO/min /mmHg	24	33.5 ± 5.5	36 ± 5	2.6 ± 4.2	<.01
Z Predicted		109 ± 20	116 ± 20	7.2 ± 13	<.02

TABLE III - 8

PULMONARY FUNCTION
GRAIN WORKERS - SMOKERS 1974, EX-SMOKER-1977 (FOLLOW-UP STUDY)

	N	1974 $\bar{x} \pm 1 \text{ SD}$	1977 $\bar{x} \pm 1 \text{ SD}$	1974-1977 Difference $\bar{x} \pm 1 \text{ SD}$	P
FEV ₁ ml	24	3904 ± 752	3875 ± 891	-28.8 ± 313	NS
% Predicted		101 ± 15	102 ± 19	- .1 ± 9.0	NS
FVC ml	24	4974 ± 798	4920 ± 932	-54.3 ± 399	NS
% Predicted		105 ± 13	104 ± 15	- .3 ± 9.1	NS
MMF L/min	22	264 ± 77	242 ± 63	- 22 ± 45	<.05
% Predicted		91.8 ± 28	84 ± 20	- 9.8 ± 18.5	<.05
$\dot{V}_{\text{Max 50}}$ L/sec	23	4.5 ± 1.5	4.3 ± 1.4	- .3 ± .7	NS
% Predicted		75 ± 25	70 ± 23	- 4.4 ± 15	NS
$\dot{V}_{\text{Max 75}}$ L/sec	18	1.8 ± .5	1.6 ± .5	- .2 ± .3	<.01
% Predicted		58 ± 15	51 ± 14	- 6.1 ± 9.0	<.01
D _L ml/CO/min /mmHg	22	30.5 ± 5.8	33 ± 6	+ 2.8 ± 4.3	<.01
% Predicted		103 ± 19	112 ± 18	+ 8.5 ± 15	<.02

TABLE III - 9

YEARLY DECREMENTS IN LUNG FUNCTIONS TESTED
IN ALL GRAIN WORKERS AND BY SMOKING CATEGORIES

Yearly Decrement:	Expected*	Actual All x \pm LSD	Smoker-Smoker x \pm LSD	Ex-smoker Ex-smoker x \pm LSD	Nonsmoker Nonsmoker x \pm LSD	Smoker Ex-smoker x \pm LSD
FEV ₁ , L	- .029	- .029 \pm .323	- .033 \pm .305	- .085 \pm .316	+ .003 \pm .399	- .028 \pm .313
FVC, L	- .025	- .064 \pm .429	.016 \pm .429	- .184 \pm .342	+ 3.6 \pm .529	- .054 \pm .399
MMF, L/min	-1.86	- 24 \pm 39	- 22 \pm 38	- 22.7 \pm 33.1	- 37 \pm 43	- 22 \pm 45
\dot{V}_{max}^{50} , L/sec	- .015	- .5 \pm 1.0	- .4 \pm 1.0	- .8 \pm 1.1	- .7 \pm .9	- .3 \pm .7
\dot{V}_{max}^{75} , L/sec	- .012	- .2 \pm .4	- .02 \pm .4	- .4 \pm .5	- .1 \pm .2	- .2 \pm .3
D _L CO	- .166	1.3 \pm 4.2	.9 \pm 3.4	.5 \pm 5.9	+ 2.6 \pm 4.2	+ 2.8 \pm 4.3

*Expected yearly mean decrement in men (>25 years old) from Knudson et al.

TABLE III - 10

PROSPECTIVE STUDY
PULMONARY FUNCTION CHANGES IN SKIN REACTORS AND NON-REACTORS
AND IN WORKERS WITH OR WITHOUT CHRONIC BRONCHITIS OR OCCUPATIONAL ASTHMA

	All Workers Mean (\pm SD) n=177	Common Antigens Mean (\pm SD)		Airborne Grain Dust Mean (\pm SD)		Chronic Bronchitis Mean (\pm SD)		Occupational Asthma I Mean (\pm SD)	
		n=26 (+)	n=139 (-)	n=49 (+)	n=116 (-)	n=63 (+)	n=114 (-)	n=108 (+)	n=69 (-)
FEV ₁ % Pred	97.7	97.7	97.8	97.3	97.9	93.7	99.9	94.5	102.8
1974	\pm 17.7	\pm 14.6	\pm 18.2	\pm 12.7	\pm 19.5	\pm 18.8	\pm 16.7	\pm 19.5	\pm 12.9
1977	98.7	96.7	98.9	96.9	99.3	95.9	100.2	95.4	103.7
	\pm 18.1	\pm 16.1	\pm 18.6	\pm 12.5	\pm 20.1	\pm 18.7	\pm 17.6	\pm 19.7	\pm 13.8
Diff	.07	-1.42	.34	-1.22	.60	1.52	-.73	.30	-.28
	\pm 8.6	\pm 6.8	\pm 8.4	\pm 6.7	\pm 8.8	\pm 9.2	\pm 8.3	\pm 9.1	\pm 8.0
MMF % Pred	86.9	85.6	87.4	81.7	89.5	81.9	89.4	83.4	91.9
1974	\pm 27.2	\pm 29.9	\pm 27.1	\pm 22.7	\pm 29.1	\pm 26.6	\pm 27.2	\pm 27.7	\pm 25.8
1977	78.4	77.5	78.7	75.3	79.9	74.0	80.6	76.0	81.8
	\pm 23.3	\pm 23.6	\pm 23.4	\pm 21.7	\pm 24.0	\pm 24.0	\pm 22.8	\pm 24.2	\pm 21.8
Diff	-9.4	-8.2	-9.8	-7.5	-10.5	-8.4	-9.9	-8.1	-11.4
	\pm 14.4	\pm 13.1	\pm 14.5	\pm 10.3	\pm 15.7	\pm 11.6	\pm 15.7	\pm 14.2	\pm 14.6
\dot{V}_{Max50} % Pred	72.8	68.9	73.5	70.1	74.0	68.8	74.9	68.8	79.1
1974	\pm 26.0	\pm 24.2	\pm 26.4	\pm 23.3	\pm 27.2	\pm 29.3	\pm 24.0	\pm 26.9	\pm 23.4
1977	65.0	65.4	65.0	61.7	66.5	62.0	66.5	61.7	70.2
	\pm 23.7	\pm 23.8	\pm 23.8	\pm 21.9	\pm 24.5	\pm 25.5	\pm 22.7	\pm 24.7	\pm 21.2
Diff	-7.8	-3.5	-8.6	-8.4	-7.4	-6.8	-8.4	-7.1	-8.9
	\pm 16.6	\pm 16.4	\pm 16.7	\pm 12.5	\pm 18.3	\pm 18.3	\pm 15.8	\pm 18.4	\pm 13.5
\dot{V}_{Max75} % Pred	55.5	52.3	56.0	55.2	55.5	50.8	57.6	54.1	57.3
1974	\pm 18.4	\pm 21.1	\pm 18.1	\pm 15.4	\pm 19.8	\pm 18.4	\pm 18.1	\pm 18.1	\pm 18.8
1977	48.7	49.3	48.6	48.1	49.0	45.2	50.2	47.1	50.7
	\pm 17.0	\pm 20.4	\pm 16.4	\pm 12.6	\pm 18.5	\pm 14.7	\pm 17.8	\pm 17.1	\pm 16.9
Diff	-6.8	-3.1	-7.4	-7.2	-6.5	-5.6	-7.3	-7.0	-6.6
	\pm 12.1	\pm 9.7	\pm 12.8	\pm 12.6	\pm 12.4	\pm 11.4	\pm 12.5	\pm 13.7	\pm 9.9

No significant changes in lung function (1974-1977) were found between positive or negative skin reactors or workers with or without chronic bronchitis or occupational asthma by unpaired t-test.

SECTION 3 - TABLES

STUDY IV

#210-75-0175

STUDY IV

TABLE OF CONTENTS

	<u>TABLE NUMBER</u>
Characteristics of Grain Handlers Tested	1
Relationship between Skin Reactivity to Common and Specific Allergens and Bronchial Reactivity to Specific Allergens	2
	 <u>FIGURE NUMBER</u>
Bronchial Challenge with D. Wheat Extracts - Airways Reactors	1
Bronchial Challenge with D. Wheat Extracts - Airways Non-reactors	2
Challenge with D. Wheat Extract After Pre-treatment with Sodium Cromoglycate	3
Bronchial Challenge with D. Wheat Extracts Subject #266	4

TABLE IV - 1

CHARACTERISTICS OF GRAIN HANDLERS TESTED

Subject	Age	Job Years	Cigarette pack-yrs	Smoking Status	Pulmonary Function Tests Pre-challenge Percent Predicted							
					FEV ₁	FVC	FEV ₁ /FVC	V _{Max} 50	V _{Max} 75	D _L CO	PC ₂₀	
Reactors												
1	59	7	25.5	Ex	66	106	49	23	31	105	2.5	
2	51	25	32.5	Ex	50	83	48	19	29	187	2.5	
3	35	13	18.0	Ex	43	71	49	16	16	122	2.5	
4	48	18	28.9	S	75	111	54	33	33	124	2.5	
5	28	7.5	19.5	Ex	104	114	74	72	54	103	Neg	
x	44	14	35.0		68	97	55	33	33	128		
Non-reactors												
6	33	10	18.0	S	94	107	70	54	52	78	Neg	
7	34	9	21.2	S	102	117	70	61	46	95	Neg	
8	30	5	8.7	Ex	102	96	78	97	88	97	Neg	
9	27	3	13.5	Ex	90	96	75	67	66	95	9.6	
10	46	23	0	NS	94	101	75	63	59	139	16.0	
11	28	8	0	NS	101	119	69	68	67	82	Neg	
x	33	10	10.0		97	106	73	68	63	98		

S = Smoker; Ex= Ex-smoker; NS = Nonsmoker.

PC₂₀ = provocation concentration of Methacholine (mg/ml) which caused at least a 20% decrease in baseline FEV₁.

TABLE IV - 2

**RELATIONSHIP BETWEEN SKIN REACTIVITY TO COMMON AND SPECIFIC
ALLERGENS AND BRONCHIAL REACTIVITY TO SPECIFIC ALLERGENS**

Subject	Skin Tests							Bronchial Challenge		
	CAA	Prick Test		AF	Intradermal			Insect or Mite	DW	ADW
		Insect	Mite		Insect or Mite	DW	ADW		DW	ADW
1	-	-	-	-	-	-	-	-	+	-
2	-	-	-	-	-	-	-	-	+	-
3	+	+	+	+	-	+	+	-	+	+
4	-	+	+	-	-	+	+	-	+	-
5	-	+	+	-	+	+	+	-	+	-
6	+	+	+	-	+	-	+	-	-	-
7	-	+	+	-	+	-	+	-	-	-
8	+	-	-	-	-	+	+	-	-	-
9	-	+	+	-	+	-	-	-	-	-
10	-	-	-	-	-	-	+	-	-	-
11	-	-	-	-	-	-	-	-	-	-

CAA - Common Allergens

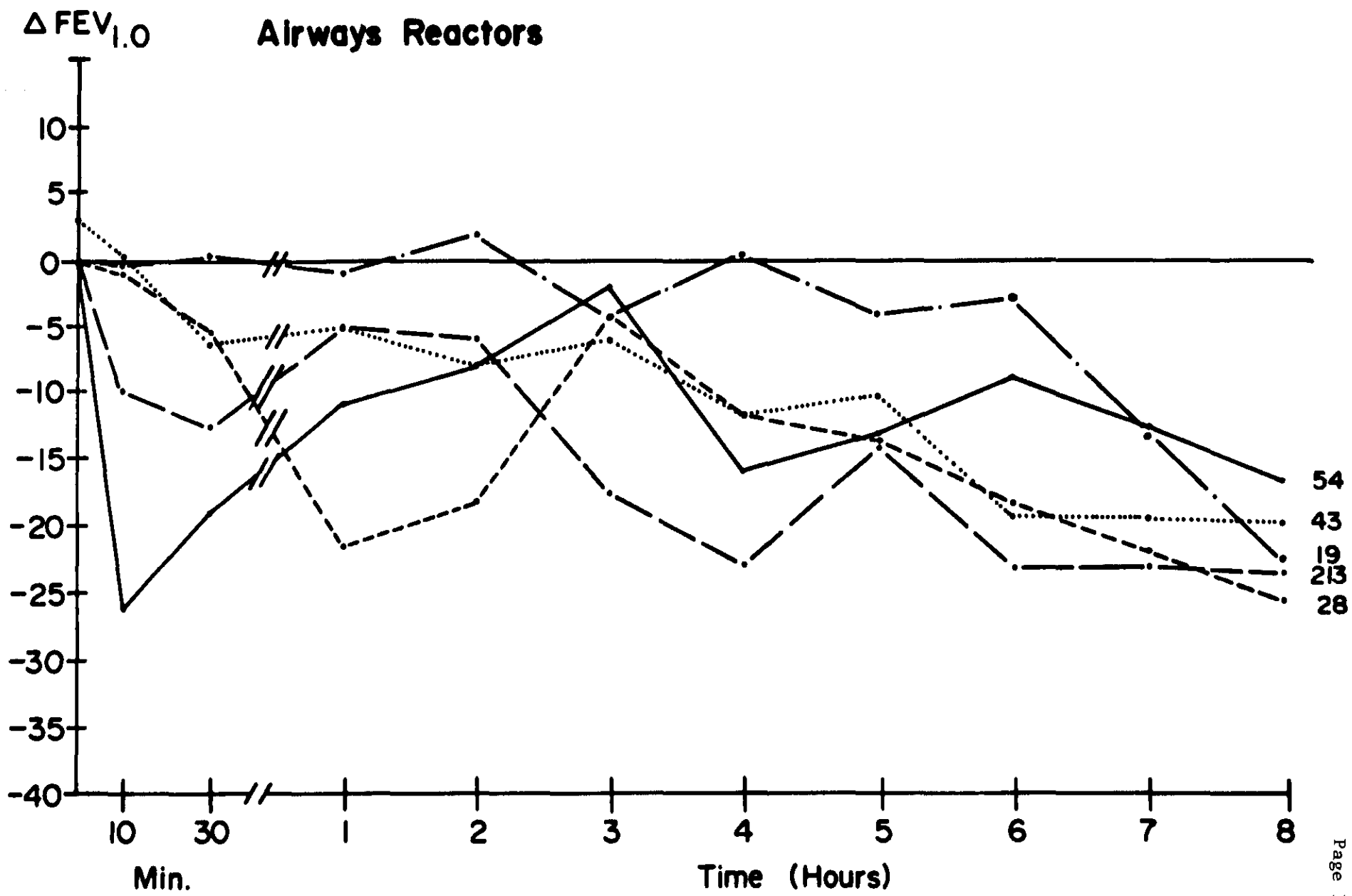
AF - Aspergillus Fumigatus

DW - Durum Wheat

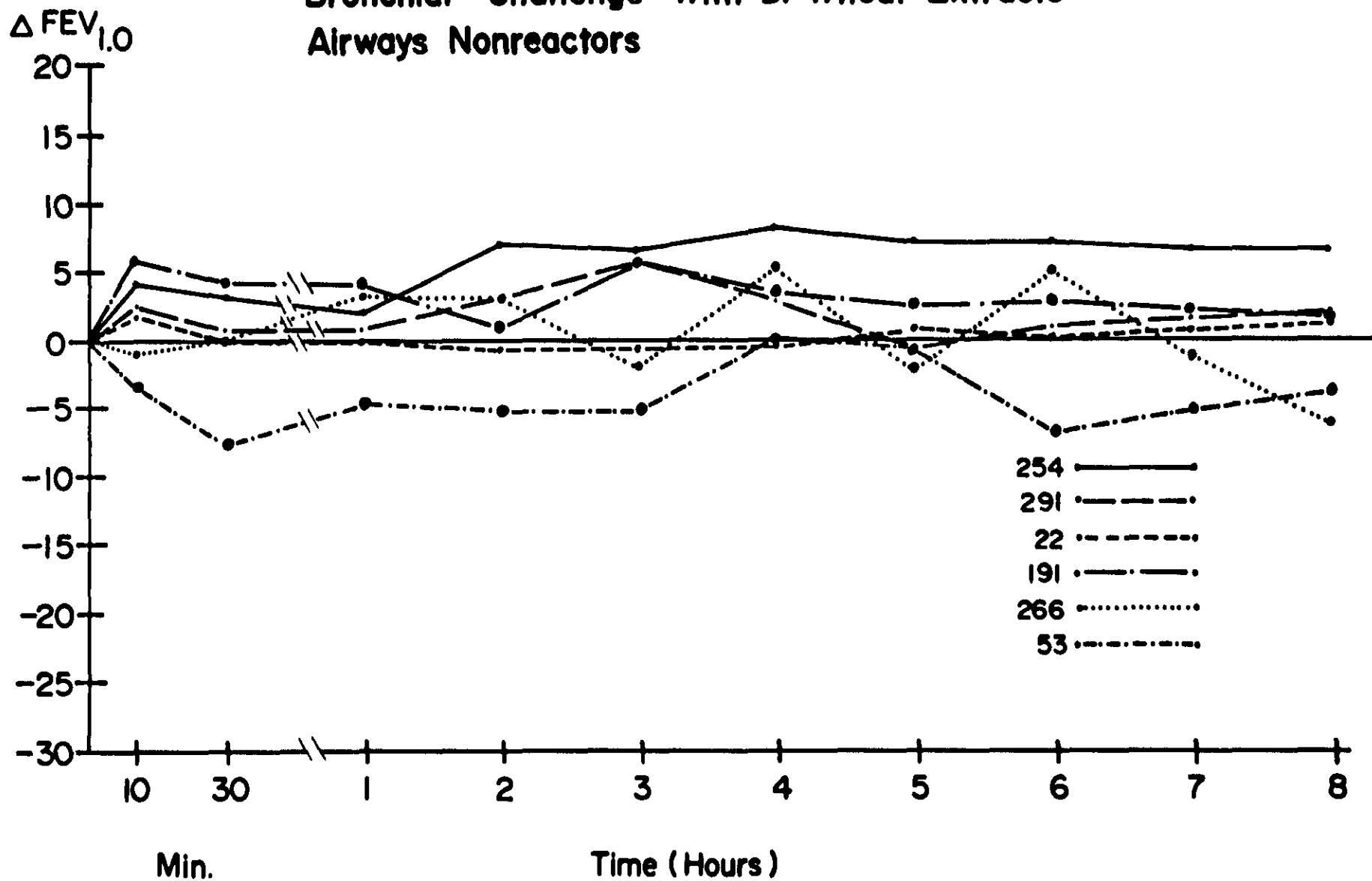
ADW - Airborne Durum Wheat Dust

Bronchial Challenge With D. Wheat Extracts

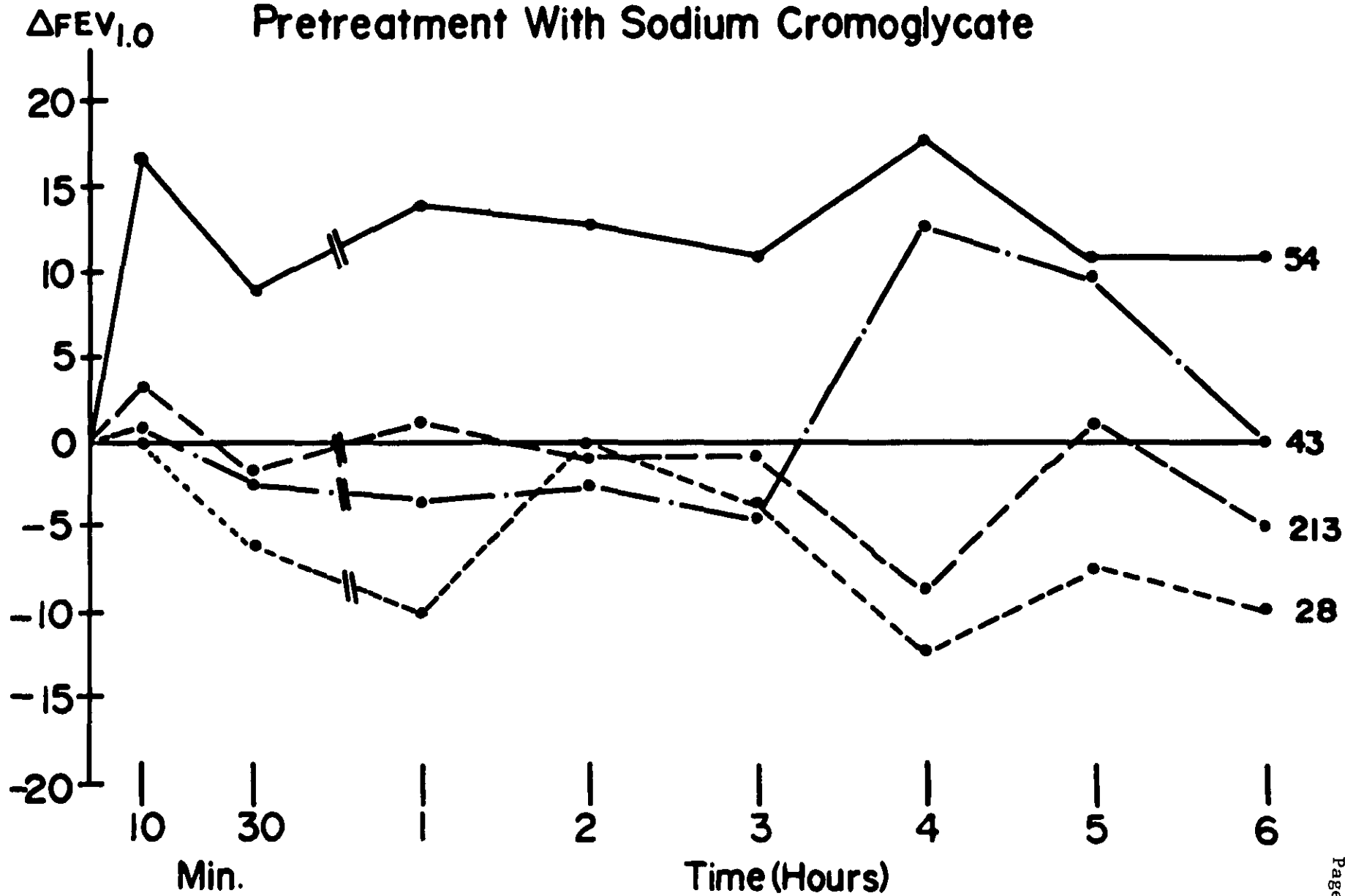
Airways Reactors

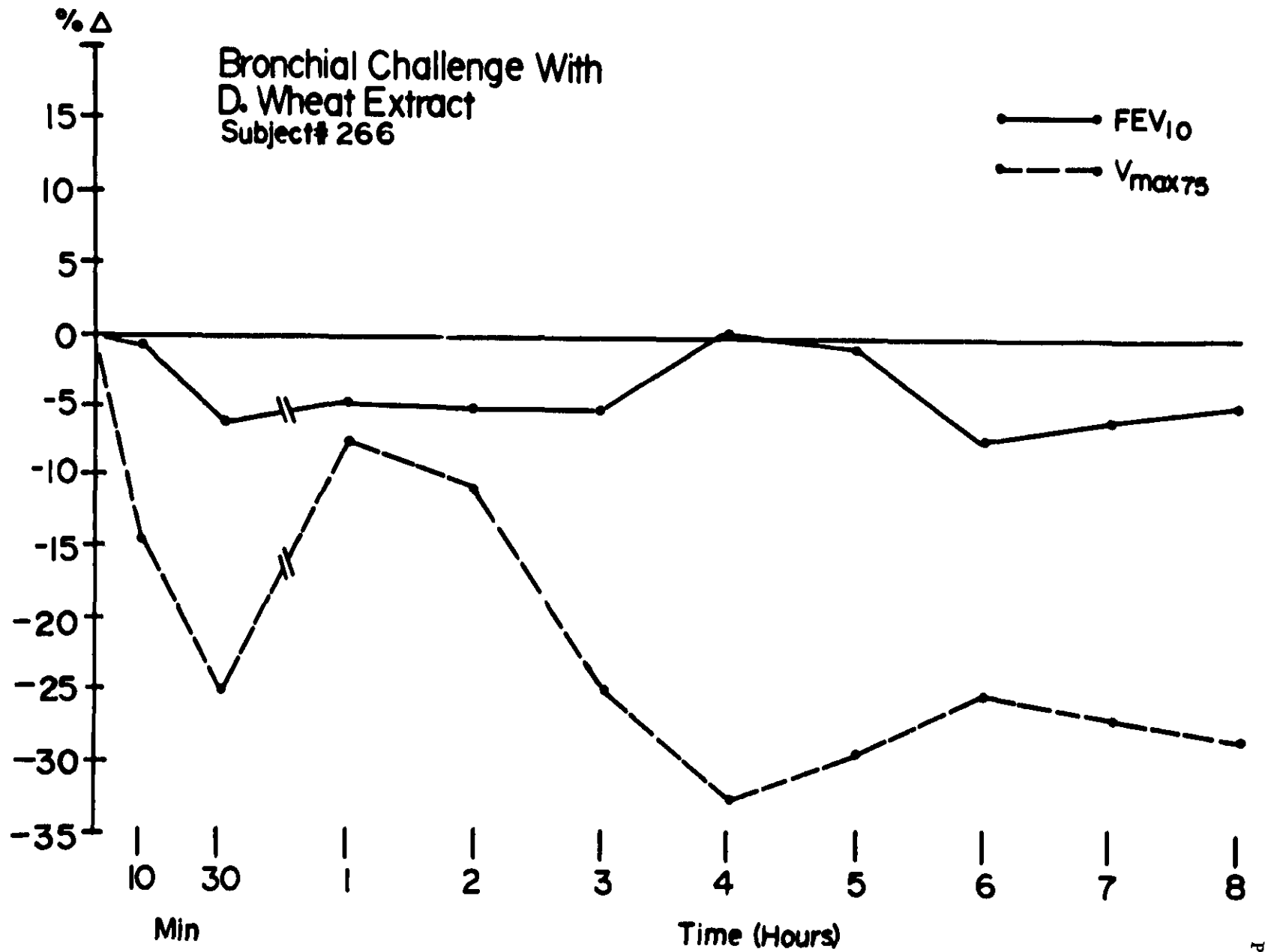


Bronchial Challenge With D. Wheat Extracts Airways Nonreactors



Challenge With D. Wheat Extract After Pretreatment With Sodium Cromoglycate





SECTION 3 - TABLES

STUDY V

#210-76-0175

STUDY V

TABLE OF CONTENTS

	<u>TABLE NUMBER</u>
Baseline and Post-Challenge with Grain Dust Results of Selected Parameters.	1
	<u>FIGURE NUMBER</u>
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - FEV ₁ % Change	1
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - FVC % Change	2
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - MMF % Change	3
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - D _L CO % Change	4
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - V _{MAX} 50 % Change	5
Change from Baseline on Control Day - and After Exposure to Airborne Grain Dust - V _{MAX} 75 % Change	6

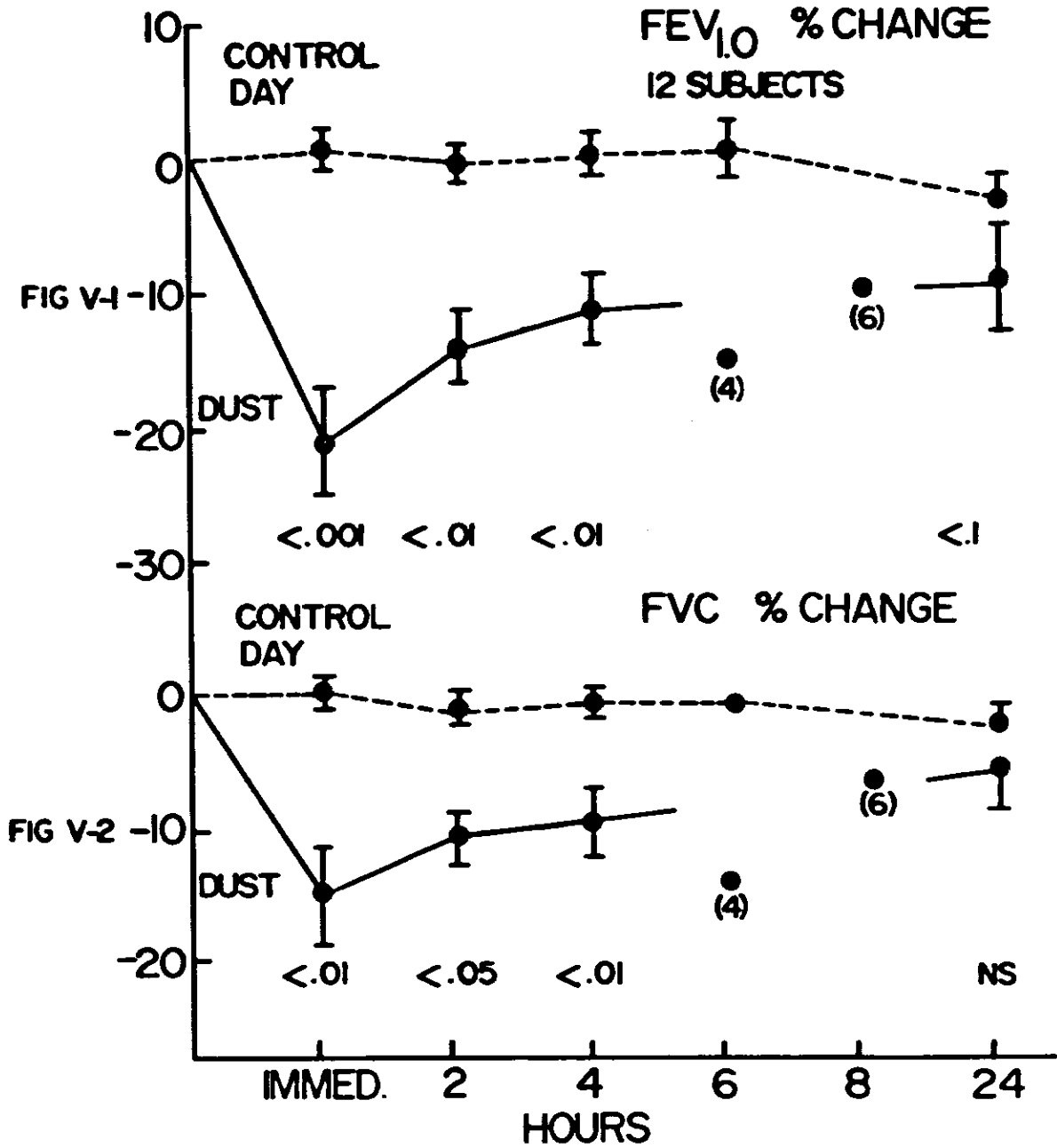
TABLE V - 1

BASELINE AND POST-CHALLENGE WITH GRAIN DUST RESULTS OF SELECTED PARAMETERS

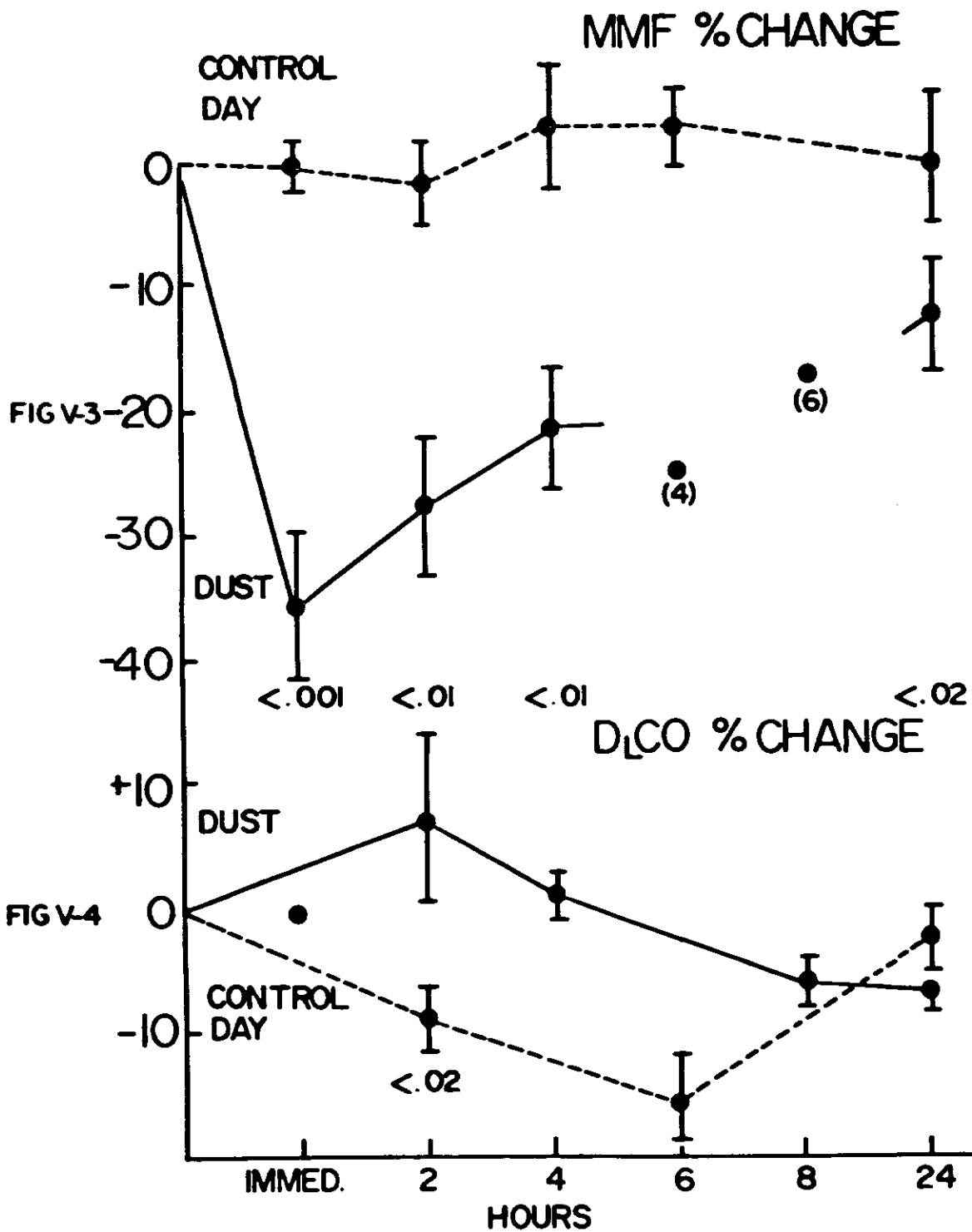
Subj. No.	Age	Current Smoker	Skin Prick Test		Base FEV ₁ /FVC %	Respir. Mecholy1† Dust Level mg/m ³	Largest Percent Change Within 24 Hours Pre-challenge Baseline						Maximum Value Post-Challenge					
			CAA	Grain Dust			FEV _{1.0}	FVC	MMF	V _{Max} 50	V _{Max} 75	DLCO	Temp C°	WBC Nx1000	PMNs %	C3		
81	48	Yes	-	-	70	-	86.7	- 3	- 6	- 4	-75	- 6	+44	38.0*	14.3*	79	-	
82	47	Yes	-	+	70	10	44	-35*	-73*	-55*	-40*	-12	- 5	37.2	11.7*	70	-	
56	30	No	-	-	83	-	86.7	-12	- 3	-31	-29	-41*	+16	39.0*	24.3*	82	+	
84	27	Yes	-	-	84	-	23	-27*	-16	-43*	-29	-51*	-17*	38.4*	21.0*	81	-	
23	57	No	+	+	61	.75	23	-27*	-29*	-55*	-36*	-50*	-21*	36.9	8.6	66	-	
32	29	No	+	+	81	-	38.6	-25*	-15	-40*	-44*	-38*	+17	38.9*	17.6*	86	-	
84	29	No	+	-	85	1.56	164	-23*	-11	-36*	-37*	-35*	+ 7	36.4	8.8	77	-	
83	27	No	-	-	82	25	143	-37*	- 6	-33	-37*	-35*	- 2	37.8*	24.3*	78	-	
81	25	No	+	-	94	-	90.1	-27*	-13*	-58*	-54*	-53*	+14	37.2	19.0*	83	-	
85	26	No	+	+	98	-	164	-11	-11	-25	-29	-21	-13	36.9	14.6*	80	-	
82	27	No	+	-	84	-	143	-23*	-22*	-18	-10	- 8	- 6	38.4*	21.2*	87	-	
80	33	No	-	-	88	-	90.1	-50*	-39*	-70*	-67*	-26	+15	37.4	22.0*	83	-	
Total																		
X		33.8																

Footnotes: CAA = common allergens, + = atopy = 2 or more positive reactions to ragweed, grass, tree alternaria, cat hair or feathers; Airborne grain dust extract, + = wheal 3mm; Temp = temperature; WBC = leukocyte count; PMN's = neutrophils; C3 = C3 level total serum complement. † Mecholy1 test negative (-) if no FEV₁ decrease 20% with 25 mg/ml dose. X similar decrement measured on control day. *-considered significantly changed from baseline.

MEAN \pm 1SE % CHANGE FROM BASELINE ON CONTROL DAY AND AFTER EXPOSURE TO AIRBORNE GRAIN DUST



MEAN \pm 1SE % CHANGE FROM BASELINE ON CONTROL DAY AND AFTER EXPOSURE TO AIRBORNE GRAIN DUST



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